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=> file reg
FILE 'REGISTRY' ENTERED AT 16:52:10 ON 03 APR 2003
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=> d his


     FILE 'HCAPLUS' ENTERED AT 15:03:58 ON 03 APR 2003
L1            72 S BURGOYNE W?/AU
L2         17459 S ?ARYLEN?
L3             9 S L1 AND L2
                 SEL L3 1-9 RN

     FILE 'REGISTRY' ENTERED AT 15:04:59 ON 03 APR 2003
L4            61 S E1-E62
L5            13 S L4 AND PMS/CI
                 SEL L5 1,2,4,5,8 RN
L6             5 S E63-E67

     FILE 'HCAPLUS' ENTERED AT 15:16:43 ON 03 APR 2003
L7            26 S L6

     FILE 'LREGISTRY' ENTERED AT 15:20:54 ON 03 APR 2003
L8               STR
L9               STR

     FILE 'REGISTRY' ENTERED AT 15:33:09 ON 03 APR 2003
L10              SCR 2043
L11           50 S L8 AND L9 AND L10
L12              STR L8
L13           44 S L12 AND L9 AND L10
L14              STR L12
L15           50 S L14 AND L9 AND L10
L16         1497 S L14 AND L9 AND L10 FUL
                 SAV L16 TRU615/A

     FILE 'LREGISTRY' ENTERED AT 15:40:14 ON 03 APR 2003
L17              STR L14

     FILE 'REGISTRY' ENTERED AT 15:45:48 ON 03 APR 2003
L18            0 S L17 AND L9 AND L10 SSS SAM SUB=L16
L19           27 S L17 AND L9 AND L10 SSS FUL SUB=L16
                 SAV L19 TRU615A/A
L20           13 S L19 AND X/ELS
                 SEL L19 2,25 RN
L21            2 S E68-E69

     FILE 'HCAPLUS' ENTERED AT 15:57:32 ON 03 APR 2003
L22            2 S L21
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L23          26 S L7 NOT L22

     FILE 'REGISTRY' ENTERED AT 15:59:06 ON 03 APR 2003
L24       74449 S 1839.6.36/RID
L25         115 S L16 AND L24
L26          80 S L25 AND X/ELS
L27          22 S L25 AND (CL OR BR)/ELS
L28          27 S L25 AND 1/NC
                E (C37H26O2.C12H8BR2)X/MF
L29           1 S E3
                E (C27H22O2.C25H28O2.C12H8BR2)X/MF
                E (C27H22O2.C25H18O2.C12H8BR2)X/MF
L30           1 S E3
                E (C25H18O2.C14H12CL2)X/MF
L31           1 S E3
                E (C49H32O2)N/MF
L32           1 S E3
                E (C37H16F8O2)NC43H34O2/MF
L33           1 S E3
                E (C37H24O2)N/MF
L34           1 S E3
                E (C37H16F8O2)N/MF
L35           2 S E3
                SEL L35 2 RN
L36           1 S E1

     FILE 'HCAPLUS' ENTERED AT 16:41:16 ON 03 APR 2003
L37           1 S L29
L38           1 S L30
L39           1 S L31
L40           1 S L32
L41           1 S L33
L42          26 S L34
L43          11 S L36
L44          40 S L23 OR L37-L43
L45          14 S L37 OR L38 OR L39 OR L40 OR L41 OR L43
L46          14 S L45 NOT L22
L47          26 S L23 NOT (L22 OR L46)
L48           0 S L42 NOT (L22 OR L46 OR L47)
L49          26 S (L23 OR L42) NOT (L22 OR L46)

     FILE 'REGISTRY' ENTERED AT 16:52:10 ON 03 APR 2003

=> d l19 que stat
L9                STR
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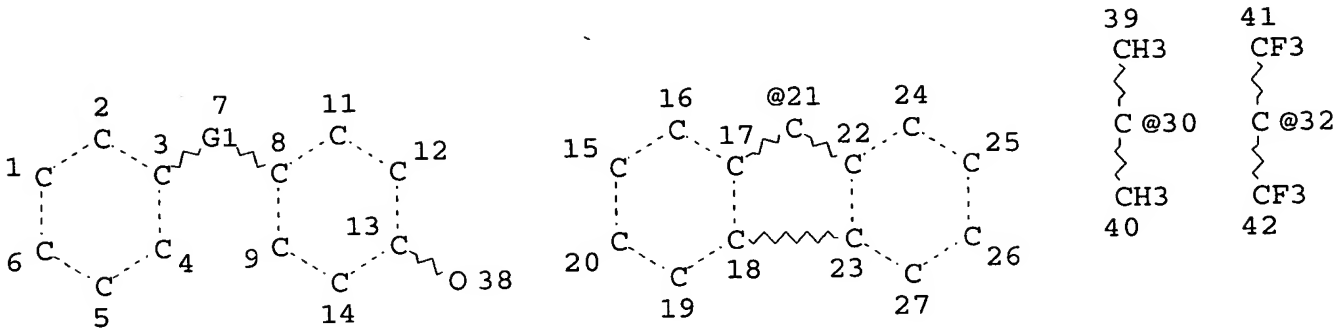

VAR G1=21/30/32
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DEFAULT ECLEVEL IS LIMITED

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STEREO ATTRIBUTES: NONE
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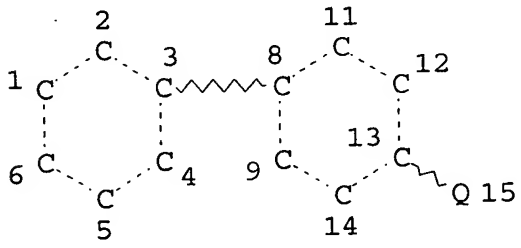
L14 STR



NODE ATTRIBUTES:
CONNECT IS E3 RC AT 6
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
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STEREO ATTRIBUTES: NONE
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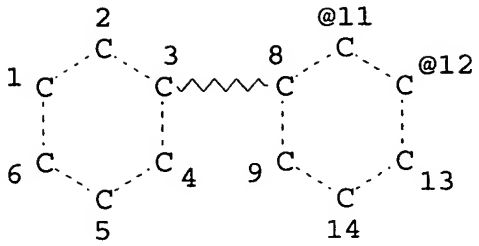
L17 STR



G1 @17 Ak @19 Ak—OH
@22 23

VAR G1=19/22
VPA 17-11/12 U
NODE ATTRIBUTES:
CONNECT IS E3 RC AT 6
CONNECT IS E3 RC AT 13
CONNECT IS E1 RC AT 19
CONNECT IS E2 RC AT 22
DEFAULT MLEVEL IS ATOM
GGCAT IS UNS AT 19
GGCAT IS UNS AT 22
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 16

STEREO ATTRIBUTES: NONE
L19 27 SEA FILE=REGISTRY SUB=L16 SSS FUL L17 AND L9 AND L10

100.0% PROCESSED 1497 ITERATIONS 27 ANSWERS
SEARCH TIME: 00.00.01

=> file hcaplus
FILE 'HCAPLUS' ENTERED AT 16:52:51 ON 03 APR 2003
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.

[redacted]

(typo)

[redacted] (typo)

=> d l22 1-2 cbib abs hitstr hitrn

L22 ANSWER 1 OF 2 HCAPLUS COPYRIGHT 2003 ACS
1999:583256 Document No. 131:229558 Abrasion-resistant polycarbonate resins, their manufacture, and their use in electrophotographic photoreceptors. Hikosaka, Takaaki (Idemitsu Kosan Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11246659 A2 19990914 Heisei, 34 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-47157 19980227.

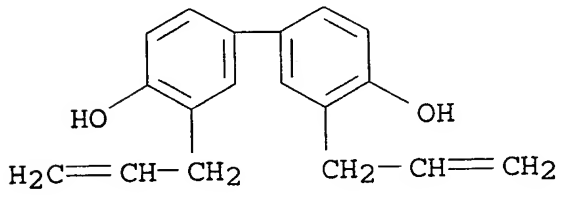
AB Title polycarbonate resin s comprise structural repeating unit OAr1OCO (I) and OAr2OCO (II) in a molar ratio of I/(I + II) = 0.001-1 (Ar1 = arom. or siloxane units, Ar 2 = arom. or siloxane units different than those for Ar1). A electrophotog. photoreceptor has at least a photosensitive layer which contains the above polycarbonate resin.

IT **243472-53-9P**
(abrasion-resistant polycarbonate resins, their manuf., and their use in electrophotog. photoreceptors)

RN 243472-53-9 HCAPLUS
CN Carbonic dichloride, polymer with 3,3'-di-2-propenyl[1,1'-biphenyl]-4,4'-diol, 4,4'-(1-methylethylidene)bis[phenol] and triethoxysilane (9CI) (CA INDEX NAME)

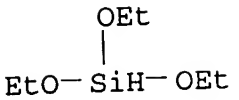
CM 1

CRN 6942-01-4
CMF C18 H18 O2



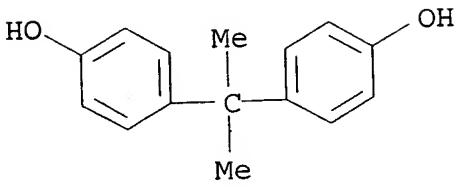
CM 2

CRN 998-30-1
CMF C6 H16 O3 Si



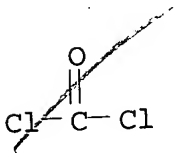
CM 3

CRN 80-05-7
CMF C15 H16 O2



CM 4

CRN 75-44-5
CMF C Cl2 O



IT **243472-53-9P**
(abrasion-resistant polycarbonate resins, their manuf., and their use in electrophotog. photoreceptors)

L22 ANSWER 2 OF 2 HCAPLUS COPYRIGHT 2003 ACS
1995:485749 Document No. 123:113183 Terminated polycarbonates and their manufacture. Totani, Yoshuki; Hirao, Genichi; Ito, Tomomichi; Nakatsuka, Masakatsu; Yamaguchi, Teruhiro (Mitsui Toatsu Chemicals, Japan). Jpn. Kokai Tokkyo Koho JP 07026008 A2 19950127 Heisei, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-176418 19930716.

AB The title polycarbonates (PC) contg. terminal groups ZOAr1 or ZOAr2XAr3 (Z = aliph. hydrocarbon groups contg. double bonds contiguous to C bonded to O; Ar1-3 = divalent arom. groups; X = bridging group) are heated as solid, liq., or melting state to give the title PC contg. terminal groups HOAr4(Z1) or HOAr5(Z1)XAr3 (Z1 = aliph. hydrocarbon groups contg. double bonds contiguous to C bonded to Ar4-5; A4-5 = trivalent arom. groups; Ar3 = divalent arom. group;

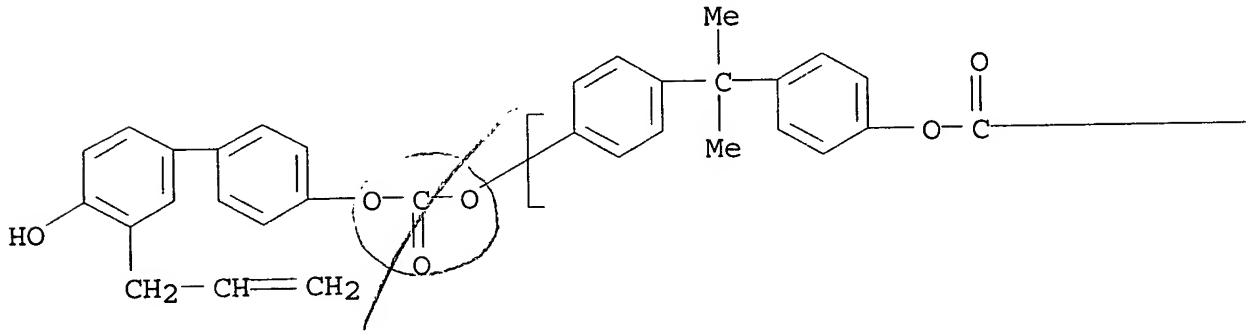
X = bridging group). Thus, 1.2 g Na hydrosulfite and 10.8 mol NaOH 2.2 L soln. were added to a suspension of 4.0 mol bisphenol A, 0.16 mol 4-(2'-propenyloxy)phenol, 4 L dichloromethane (I), and 4 L water in N-blanketed system at 15.degree., 5.0 mol phosgene was fed to the system at 8.25 g/min, 0.64 g Et3N was added, the mixt. was polymd. under stirring, sepd., neutralized by HCl, washed with water, heated to .apprx.90.degree. in 2 L toluene and 5 L water for removal of I and toluene to give powd. PC contg. 4-hydroxy-3-(2'-propenyl)phenyl terminal groups with no. av. mol. wt. 153,00, wt. av. mol. wt. 46,600, and glass temp. 145.3.degree..

IT **166595-53-5P**
(polycarbonates contg. double bond-contg. aliph. hydrocarbon groups and phenolic OH groups on same terminals with reactivity and high Tg)

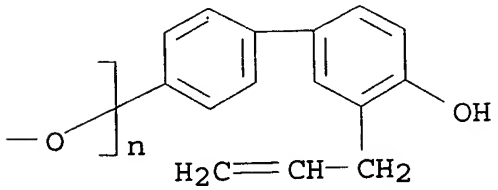
RN 166595-53-5 HCAPLUS

CN Poly[oxycarbonyloxy-1,4-phenylene(1-methylethylidene)-1,4-phenylene], .alpha.-[4'-hydroxy-3'-(2-propenyl)[1,1'-biphenyl]-4-yl]-.omega.-[[[[4'-hydroxy-3'-(2-propenyl)[1,1'-biphenyl]-4-yl]oxy]carbonyl]oxy]- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B

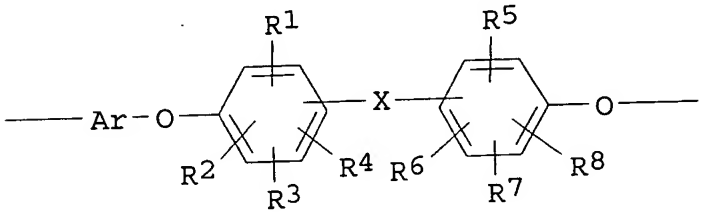


IT **166595-53-5P**
(polycarbonates contg. double bond-contg. aliph. hydrocarbon groups and phenolic OH groups on same terminals with reactivity and high Tg)

=> d l46 1-14 cbib abs hitstr hitrn

L46 ANSWER 1 OF 14 HCAPLUS COPYRIGHT 2003 ACS
2003:111124 Document No. 138:138065 Heat-resistant polyether, heat-curable polyether, and coating material prepared thereby for electronic devices. Yoshida, Yuji; Takikawa, Mikio; Sato, Naoya (Sumitomo Chemical Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2003041184 A2 20030213, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-231222 20010731.

GI



I

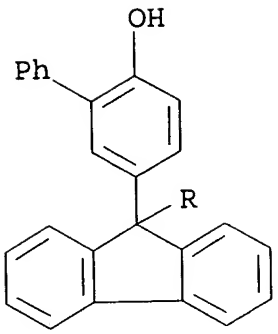
AB Polyether with Mw of 1,000-50,000, which has high heat-resistance (>300.degree.), sufficient soly. in solvent, low water absorption , and good adhesion, possesses repeating unit I, in which Ar = divalent org. group contg. arom. ring, R1-8 = H and substituted aryl group, X = C1-20 hydrocarbonyl radical, furthermore, at the condition of R1-8 = H, X = -CR9 (R10)- (2) and R9-10 = H or substituted aryl. Heat-curable polyester coating material obtained from the crosslinking product of the above polyether can be used to form insulating layer for electronic devices. Thus, 1,1-bis(4-hydroxy-3-phenylphenyl)cyclohexylidene and dibromobiphenyl were polymd. in the presence of catalyst, CuCl-pyridine complex, at 170-190.degree. for 80 min. to obtain a heat-resistant polyether with Mw of 4,600 and decompn. temp. of 390.degree..

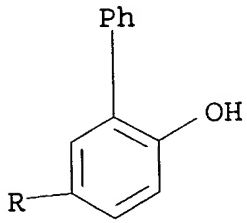
IT **492454-21-4DP**, reaction products with dimethylvinylsilylchloride **492454-21-4P**
492454-25-8DP, reaction products with dimethylvinylsilylchloride **492454-25-8P**
(heat-resistant polyether for coating material of electronic devices)

RN 492454-21-4 HCAPLUS
CN [1,1'-Biphenyl]-2-ol, 5,5''-(9H-fluoren-9-ylidene)bis-, polymer with 4,4'-dibromo-1,1'-biphenyl (9CI) (CA INDEX NAME)

CM 1

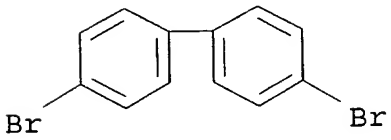
CRN 161256-84-4
CMF C37 H26 O2





CM 2

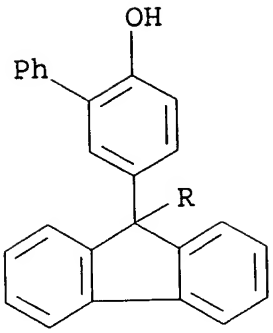
CRN 92-86-4
CMF C12 H8 Br2

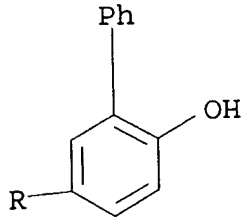


RN 492454-21-4 HCAPLUS
CN [1,1'-Biphenyl]-2-ol, 5,5''-(9H-fluoren-9-ylidene)bis-, polymer with 4,4'-dibromo-1,1'-biphenyl (9CI) (CA INDEX NAME)

CM 1

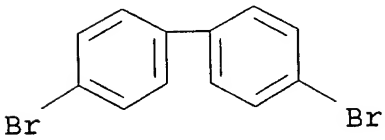
CRN 161256-84-4
CMF C37 H26 O2



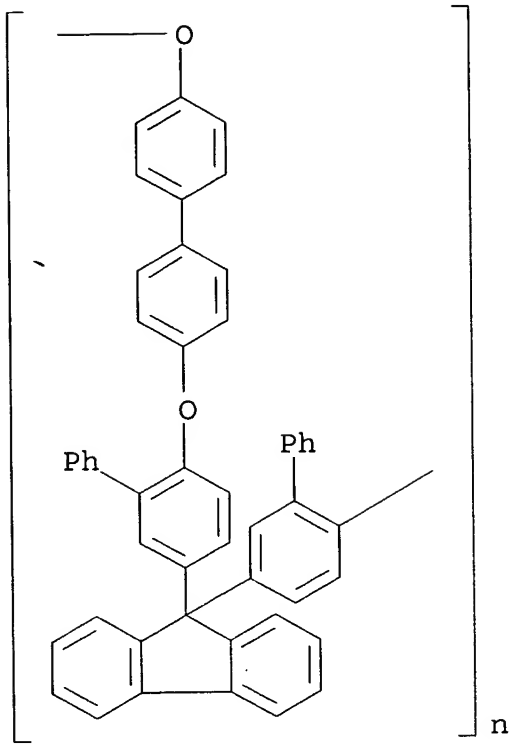


CM 2

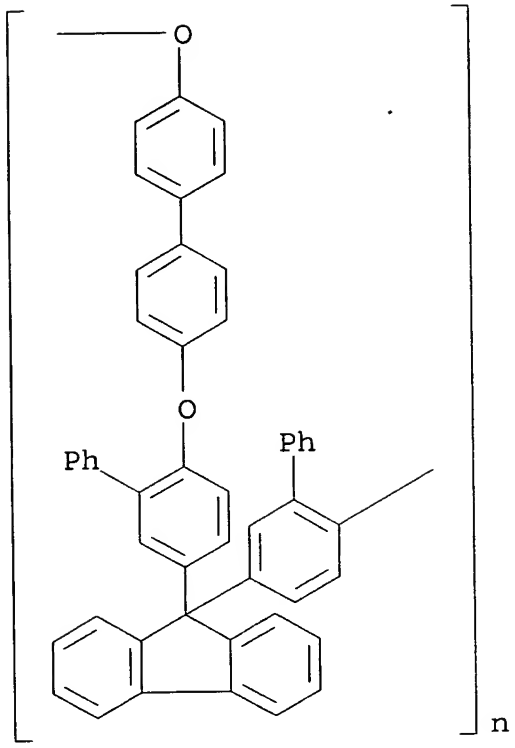
CRN 92-86-4
CMF C12 H8 Br2



RN 492454-25-8 HCAPLUS
CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy[1,1'-biphenyl]-2,5-diyl-9H-fluoren-9-ylidene[1,1'-biphenyl]-5,2-diyl) (9CI) (CA INDEX NAME)



RN 492454-25-8 HCAPLUS
CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy[1,1'-biphenyl]-2,5-diyl-9H-fluoren-9-ylidene[1,1'-biphenyl]-5,2-diyl) (9CI) (CA INDEX NAME)



IT **492454-21-4DP**, reaction products with dimethylvinylsilylchloride **492454-21-4P**
492454-25-8DP, reaction products with dimethylvinylsilylchloride **492454-25-8P**
(heat-resistant polyether for coating material of electronic devices)

L46 ANSWER 2 OF 14 HCAPLUS COPYRIGHT 2003 ACS
2001:581406 Document No. 135:167697 Cardo polyoxyarylene composition for film formation and insulating film. Okada, Takashi; Nishikawa, Michinori; Yamada, Kinji (Jsr Corp., Japan). Eur. Pat. Appl. EP 1122746 A1 20010808, 23 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2001-102318 20010201. PRIORITY: JP 2000-24658 20000202.

AB The title compns. comprise cardo polyoxyarylenes and are useful as insulating films which are obtained by applying the compn. for film formation to a substrate and heating the coating film. A polymer was prepd. from 9,9-Bis(4-hydroxyphenyl)fluorene and 2,4-dichlorotoluene.

IT **353454-30-5P 353454-38-3P**
(cardo polyoxyarylene compn. for film formation and insulating film)

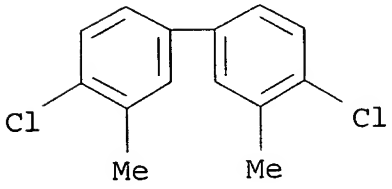
RN 353454-30-5 HCAPLUS

CN Phenol, 4,4'-(9H-fluoren-9-ylidene)bis-, polymer with

4,4'-dichloro-3,3'-dimethyl-1,1'-biphenyl (9CI) (CA INDEX NAME)

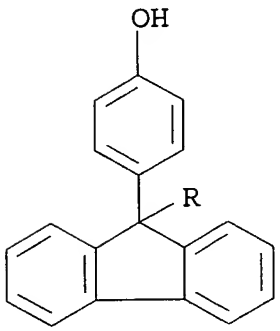
CM 1

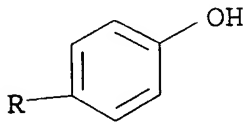
CRN 19482-16-7
CMF C14 H12 Cl2



CM 2

CRN 3236-71-3
CMF C25 H18 O2

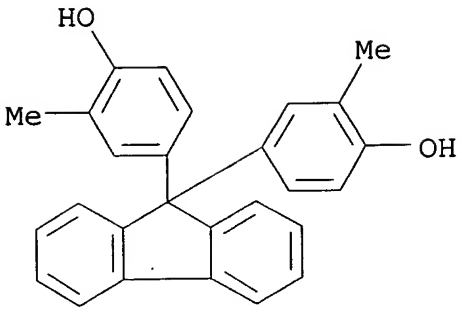




RN 353454-38-3 HCAPLUS
CN Phenol, 4,4'-(9H-fluoren-9-ylidene)bis[2-methyl-, polymer with 4,4'-dibromo-1,1'-biphenyl and 4,4'-(9H-fluoren-9-ylidene)bis[phenol] (9CI) (CA INDEX NAME)

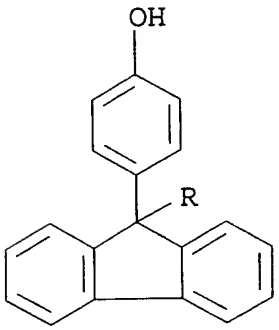
CM 1

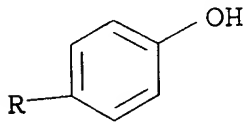
CRN 88938-12-9
CMF C27 H22 O2



CM 2

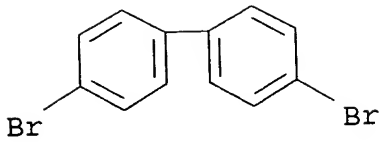
CRN 3236-71-3
CMF C25 H18 O2





CM 3

CRN 92-86-4
CMF C12 H8 Br2



IT **353454-30-5P 353454-38-3P**
(cardo polyoxyarylene compn. for film formation and insulating film)

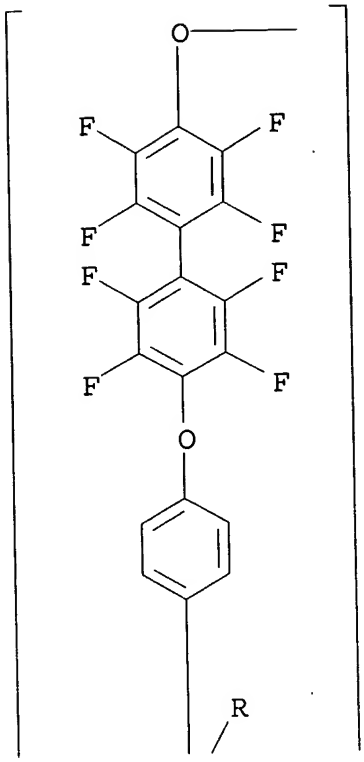
L46 ANSWER 3 OF 14 HCAPLUS COPYRIGHT 2003 ACS
1999:2311 Document No. 130:139992 Dielectric relaxation behavior of fluorinated aromatic poly(ether)s and poly(ether ketone)s. Goodwin, A. A.; Atkinson, J. R.; Hay, J. N.; Mercer, F. W. (Materials Engineering, Monash University, Clayton, 3168, Australia). Polymer, Volume Date 1999, 40(6), 1515-1524 (English) 1998. CODEN: POLMAG. ISSN: 0032-3861. Publisher: Elsevier Science Ltd..

AB Eight amorphous, thermoplastic arom. poly(ether)s and poly(ether ketone)s contg. cyclic 2,2'-biphenyl, hexafluoroisopropylidene, perfluorophenylene, and oxadiazole groups were investigated by dielec. relaxation spectroscopy over the frequency range 20-105 Hz and the temp. range 130-300.degree.. For the polymers contg. perfluorophenylene units, three relaxation processes were obsd.; one corresponding to the glass transition (.alpha.-relaxation), and a further two sub-Tg secondary process (.beta.- and .gamma.-processes). For polymers without perfluorophenylene units, a .beta.-process was not detected. The sub-Tg transitions followed Arrhenius behavior and were sensitive to polymer structure and chain flexibility. The sub-ambient relaxation exhibited a strong dependence on absorbed moisture. The polymers contg. perfluorophenylene units showed a significant decrease in dielec. permittivity at 100 kHz and this was attributed mainly to a reduced electronic polarizability. The .alpha.-relaxation strength of the perfluorinated polymers, which arises from dipolar motions, was also reduced.

IT **136835-82-0**
(effects of fluorination and chem. structure on dielec. relaxation of arom. polyethers and polyether polyketones)

RN 136835-82-0 HCAPLUS
CN Poly[oxy(2,2',3,3',5,5',6,6'-octafluoro[1,1'-biphenyl]-4,4'-diyl)oxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A



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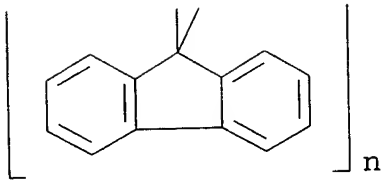
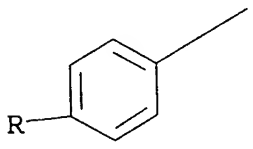




IT **136835-82-0**
(effects of fluorination and chem. structure on dielec. relaxation of arom. polyethers and polyether polyketones)

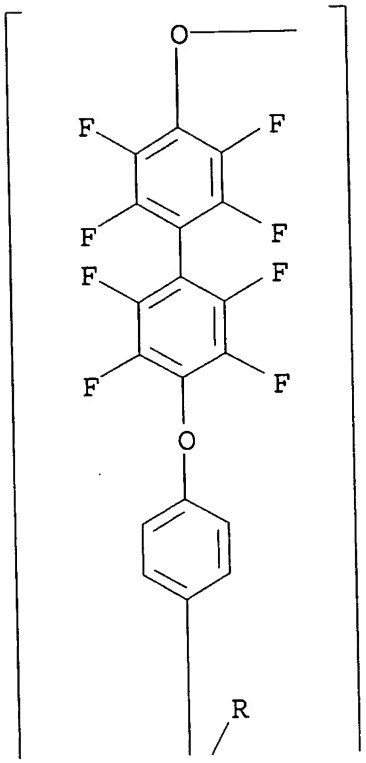
L46 ANSWER 4 OF 14 HCAPLUS COPYRIGHT 2003 ACS
1998:102066 Document No. 128:128808 Metal/polymer interfacial interactions: chromium-fluorinated poly(aryl ether). Helfand, Martin A.; Sadowski, Richard A.; Mercer, Frank W. (Raychem Corporation, Menlo Park, CA, 94025, USA). Plastics Engineering (New York), 43(Metallized Plastics), 129-139 (English) 1998. CODEN: PLENEZ. ISSN: 1040-2527. Publisher: Marcel Dekker, Inc..

AB The deposition of Cr on two fluorinated poly(aryl ether) (FPAE) polymers has been investigated with XPS. Fluorine moieties were obsd. to be highly reactive towards the deposited Cr. Differences in polymeric fluorine chem. (aliph. vs. arom.) did not affect the reaction pathway or the final reaction products. Interfacial deposition products form in a step-wise fashion dependent upon metal coverage. A model is proposed whereby the formation of reaction products is initiated by electron transfer from the metal to the polymer followed by the formation of Cr-fluorides and finally Cr-carbides prior to the formation of a continuous unreacted metal overlayer.

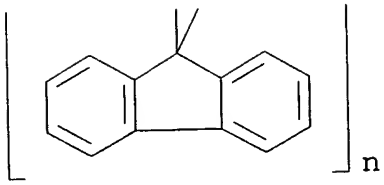
IT **136835-82-0**, 9,9-Bis(4-hydroxyphenyl)fluorene-decafluorobiphenyl copolymer, sru
(deposition of chromium on fluorinated poly(aryl ethers) and metal/polymer interfacial interactions in metalized polymers)

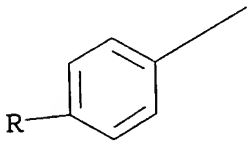
RN 136835-82-0 HCAPLUS
CN Poly[oxy(2,2',3,3',5,5',6,6'-octafluoro[1,1'-biphenyl]-4,4'-diyl)oxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A





IT **136835-82-0**, 9,9-Bis(4-hydroxyphenyl)fluorene-decafluorobiphenyl copolymer, sru
(deposition of chromium on fluorinated poly(aryl ethers) and metal/polymer interfacial interactions in metalized polymers)

L46 ANSWER 5 OF 14 HCAPLUS COPYRIGHT 2003 ACS
1997:500799 Document No. 127:109478 Dynamic mechanical behavior of fluorinated aromatic poly(ethers). Goodwin, A. A.; Mercer, F. W. (Materials Engineering, Monash Univ., Clayton, 3168, Australia). Journal of Polymer Science, Part B: Polymer Physics, 35(12), 1963-1971 (English) 1997. CODEN: JPBPEM. ISSN: 0887-6266. Publisher: Wiley.

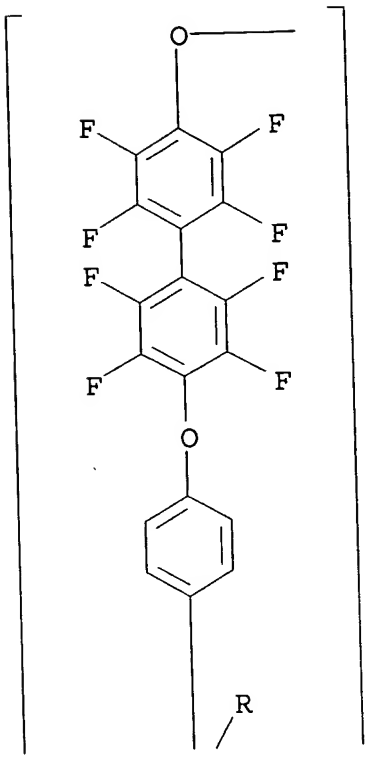
AB The relaxation behavior of six fluorinated arom. poly(ethers) was investigated using dynamic mech. anal. The glass transition temp. was found to increase as the size and rigidity of linking groups increased and varied between 168.degree.C for a di-Me linking group and 300.degree.C for a bicyclic benzoate ether-linking group. For the .alpha.-relaxation the steepness of time/temp. plots and broadness of the loss curves could be qual. correlated with chem. structure in a manner predicted by the coupling model of relaxation. Well-sepd. sub-Tg transitions were also obsd., as a shoulder on the low temp. side of the .alpha.-peak, and as a broad, low loss transition around -100.degree.C. The higher temp. process was similar to the structural relaxation often found in quenched glassy polymers, while the position, intensity, and breadth of the subambient process was sensitive to chem. structure.

IT **136835-82-0**, 9,9-Bis(4-hydroxyphenyl)fluorene-decafluorobiphenyl copolymer, SRU
(dynamic mech. behavior of)

RN 136835-82-0 HCAPLUS

CN Poly[oxy(2,2',3,3',5,5',6,6'-octafluoro[1,1'-biphenyl]-4,4'-diyl)oxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A



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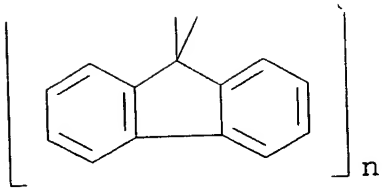
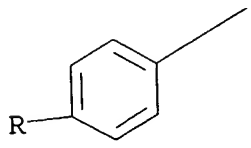




IT **136835-82-0**, 9,9-Bis(4-hydroxyphenyl)fluorene-decafluorobiphenyl copolymer, SRU
(dynamic mech. behavior of)

L46 ANSWER 6 OF 14 HCAPLUS COPYRIGHT 2003 ACS
1996:255088 Document No. 125:12343 Self-crosslinkable poly(arylene ether)s based on phenylenetriazene pendants. Lau, Aldrich N. K.; Vo, Lanchi P. (Raychem Corp., Menlo Park, CA, 94025-1164, USA). Polymeric Materials Science and Engineering, 69, 242-3 (English) 1993. CODEN: PMSEDG. ISSN: 0743-0515. Publisher: American Chemical Society.

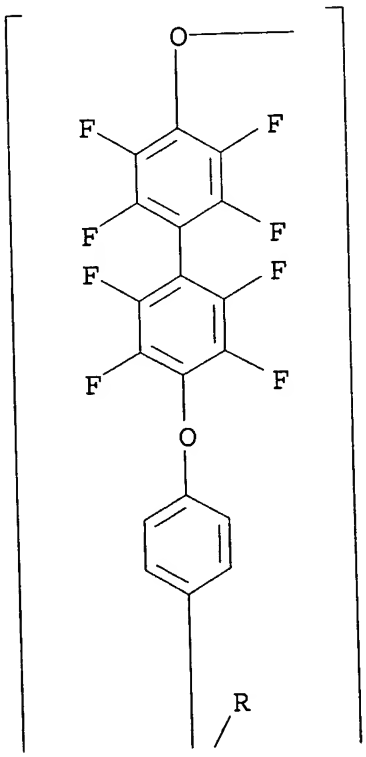
AB Synthesis and characterization of self-crosslinkable fluorinated poly(arylene ethers) based on pendent phenylenetriazines was reported. At elevated temp., the polymers were crosslinked through the formation of thermooxidatively stable aryl-aryl C-C bond.

IT **136835-82-0DP**, 9,9-Bis(4-hydroxyphenyl)fluorene-decafluorobiphenyl copolymer, sru, reaction products with triazene-contg. phenol derivs.
(self-crosslinkable poly(arylene ether)s based on phenylenetriazene pendants)

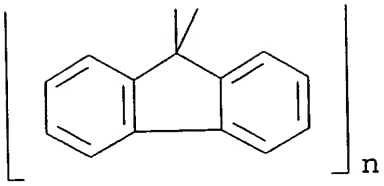
RN 136835-82-0 HCAPLUS

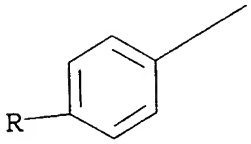
CN Poly[oxy(2,2',3,3',5,5',6,6'-octafluoro[1,1'-biphenyl]-4,4'-diyl)oxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A





IT **136835-82-0DP**, 9,9-Bis(4-hydroxyphenyl)fluorene-decafluorobiphenyl copolymer, sru, reaction products with triazene-contg. phenol derivs.
(self-crosslinkable poly(arylene ether)s based on phenylenetriazene pendants)

L46 ANSWER 7 OF 14 HCAPLUS COPYRIGHT 2003 ACS
1994:484111 Document No. 121:84111 Synthesis and characterization of new poly(arylene ethers) with low dielectric constant. Mercer, Frank W.; Coffin, Chris; Duff, David W. (Raychem Corp., Menlo Park, CA, 94025-1164, USA). ACS Symposium Series, 537(Polymer for Microelectronics), 546-53 (English) 1994. CODEN: ACSMC8. ISSN: 0097-6156.

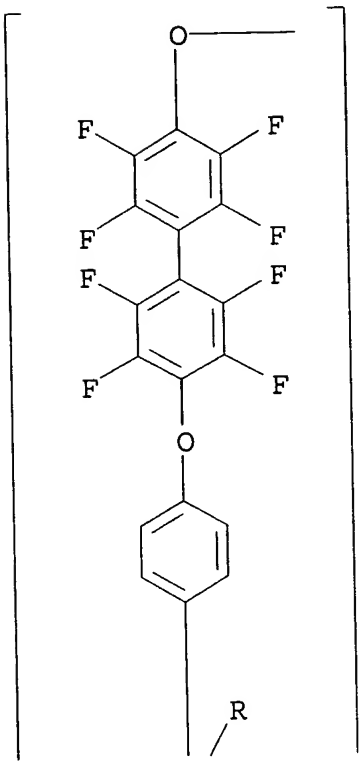
AB Six F-contg. poly(arylene ethers) were prepd. by polymg. decafluorobiphenyl with 4,4'-(hexafluoroisopropylidene)diphenol (bisphenol AF), 9,9-bis(4-hydroxyphenyl)fluorene, 1,1-bis(4-hydroxyphenyl)-1-phenylethane (bisphenol AP), phenolphthalein, fluorescein, and Me 3,5-dihydroxybenzoate. The polymers exhibited low dielec. consts. and moisture absorption and excellent thermal and mech. properties and may be useful in electronic applications.

IT **136835-82-0P**, 9,9-Bis(4-hydroxyphenyl)fluorene-decafluorobiphenyl copolymer, SRU
(prepn. and properties of)

RN 136835-82-0 HCAPLUS

CN Poly[oxy(2,2',3,3',5,5',6,6'-octafluoro[1,1'-biphenyl]-4,4'-diyl)oxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A



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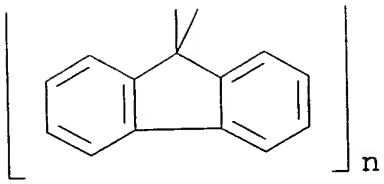

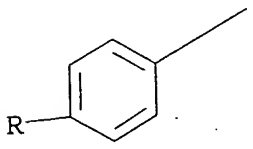

IT **136835-82-0P**, 9,9-Bis(4-hydroxyphenyl)fluorene-decafluorobiphenyl copolymer, SRU
(prepn. and properties of)

L46 ANSWER 8 OF 14 HCAPLUS COPYRIGHT 2003 ACS
1994:246609 Document No. 120:246609 1-[(Hydroxyphenoxy)phenyl]triazene
s as novel crosslinkers, especially for fluorinated poly(arylene
ethers).. Lau, Aldrich N. K.; Vo, Lanchi P. (Raychem Corp., USA).
U.S. US 5250667 A 19931005, 11 pp. (English). CODEN: USXXAM.
APPLICATION: US 1992-943093 19920909.

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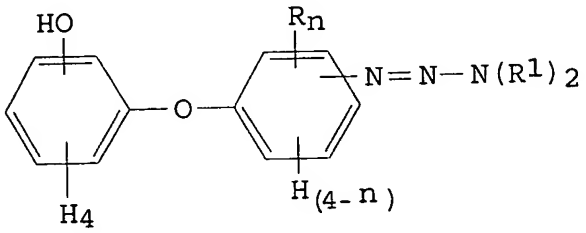

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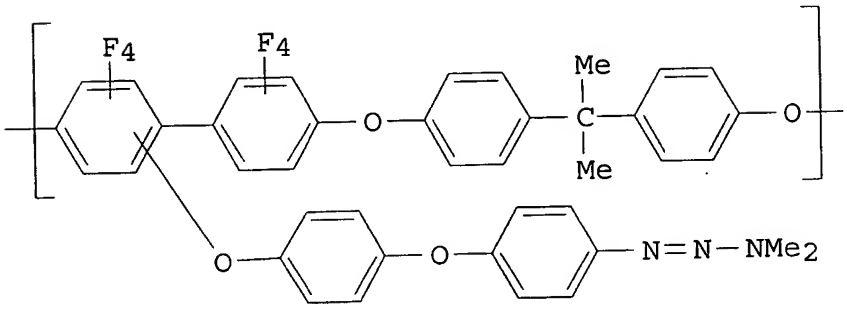


III

AB Triazenes I [R = F, CF3, Cl, CN; each R1 = C1-6 (hydroxy)alkyl, aryl; n = 0, 1] were prepd. as derivatizing and crosslinking agents for polymers, esp. fluorinated poly(arylene ethers), which are useful as dielecs. in multichip modules, protective layers or coatings in electronic packaging, etc. (no data). Thus, 4-HOC6H4OC6H4N:NNMe2-4 (II) was prepd. by etherification of 4-PhCH2OC6H4OH with FC6H4NO2-4, followed by redn. of the NO2 group, diazotization of the resulting amino deriv., coupling of the diazo compd. with NHMe2, and debenzylation. Heating of II with a perfluorobiphenyl-bisphenol A copolymer at 80.degree. in AcNMe2 for 16 h under N in the presence of K2CO3 gave a functionalized poly(arylene ether) (III), which was heated at 300.degree. to give a cured title polymer free from solvent-induced stress crazing, having Tg 236.degree. (DSC at 10.degree./min under N), dielec. const. 2.83 (60% relative humidity), and gel content 99.7%.

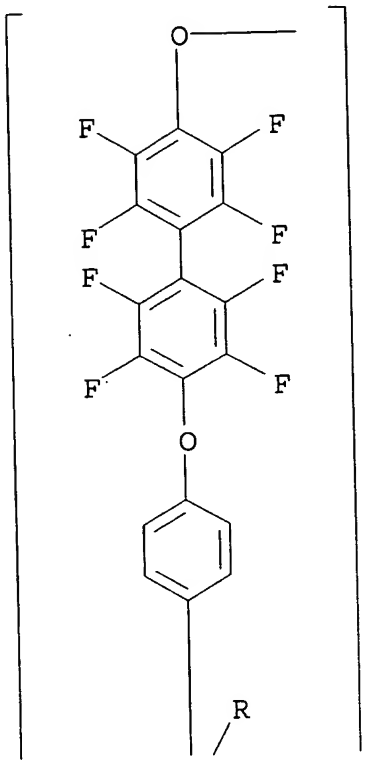
IT **136835-82-0DP**, reaction products with
[(hydroxyphenoxy)phenyl]triazenes
(prepn. and crosslinking of)

RN 136835-82-0 HCAPLUS

CN Poly[oxy(2,2',3,3',5,5',6,6'-octafluoro[1,1'-biphenyl]-4,4'-diyl)oxy-

1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A



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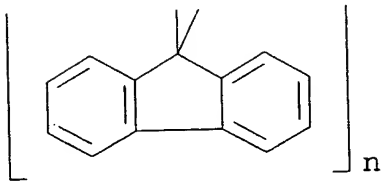
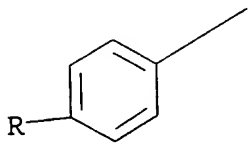




IT **136835-82-0DP**, reaction products with

[(hydroxyphenoxy)phenyl]triazenes
(prepn. and crosslinking of)

L46 ANSWER 9 OF 14 HCAPLUS COPYRIGHT 2003 ACS
1993:650919 Document No. 119:250919 Low dielectric constant fluorinated aryl ethers prepared from decafluorobiphenyl. Mercer, Frank; Duff, David; Wojtowicz, Janusz; Goodman, Timothy (Corp. Res. Dev., Raychem Corp., Menlo Park, CA, 94025, USA). Polymeric Materials Science and Engineering, 66, 198-9 (English) 1992. CODEN: PMSEDG. ISSN: 0743-0515.

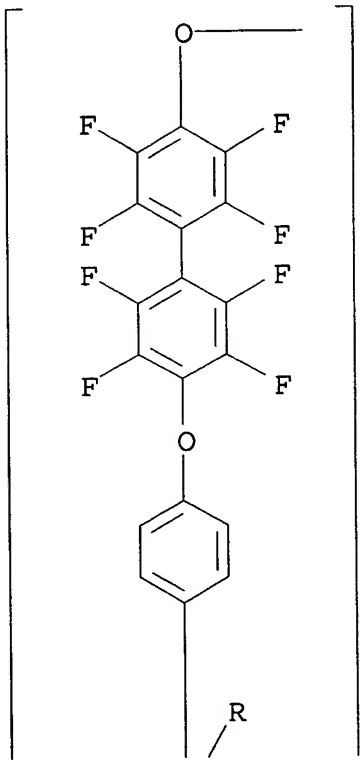
AB Fluorinated polyethers are prepd. by polycondensation of decafluorobiphenyl with various bisphenols. The thermal and mech. properties and dielec. properties of the resulting polymers are reported.

IT **136835-82-0P**
(prepn. and dielec. properties of)

RN 136835-82-0 HCAPLUS

CN Poly[oxy(2,2',3,3',5,5',6,6'-octafluoro[1,1'-biphenyl]-4,4'-diyl)oxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A



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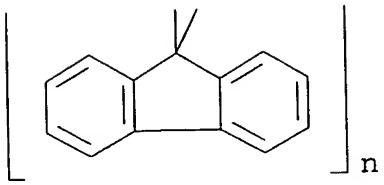
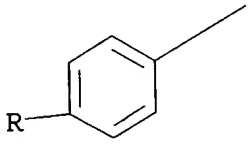




IT **136835-82-0P**
(prepn. and dielec. properties of)

L46 ANSWER 10 OF 14 HCAPLUS COPYRIGHT 2003 ACS
1992:470430 Document No. 117:70430 Synthesis and characterization of fluorinated aryl ethers prepared from decafluorobiphenyl. Mercer, Frank; Goodman, Tim; Wojtowicz, Janusz; Duff, David (Raychem, Menlo Park, CA, 94025, USA). Journal of Polymer Science, Part A: Polymer Chemistry, 30(8), 1767-70 (English) 1992. CODEN: JPACEC. ISSN: 0887-624X.

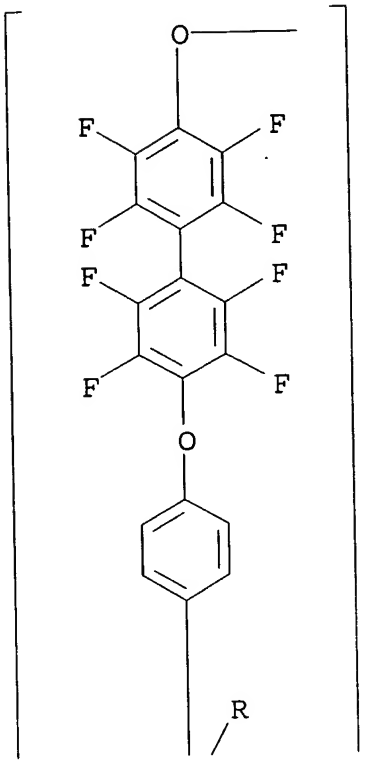
AB Fluorinated polyethers were obtained by polycondensation of decafluorobiphenyl with hexafluorobisphenol A or 9,9-bis(4-hydroxyphenyl)fluorene. The polyethers had low dielec. consts. and moisture absorption and initial wt. losses in air at 500.degree.. Tough, transparent films could be obtained.

IT **136835-82-0P**
(prepn. and characterization of)

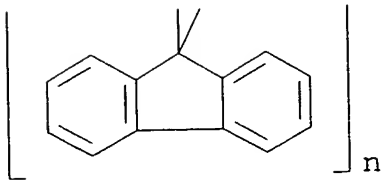
RN 136835-82-0 HCAPLUS

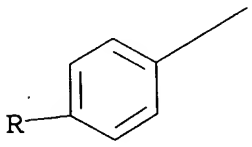
CN Poly[oxy(2,2',3,3',5,5',6,6'-octafluoro[1,1'-biphenyl]-4,4'-diyl)oxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A





IT **136835-82-0P**
(prepn. and characterization of)

L46 ANSWER 11 OF 14 HCAPLUS COPYRIGHT 2003 ACS

1992:236362 Document No. 116:236362 Crosslinkable fluorine-containing aromatic polyethers. Mercer, Frank W.; Goodman, Timothy D.; Lau, Aldrich N. K.; Vo, Lanchi P. (Raychem Corp., USA). PCT Int. Appl. WO 9116370 A1 19911031, 37 pp. DESIGNATED STATES: W: CA, JP; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, NL, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1991-US2575 19910415. PRIORITY: US 1990-510353 19900417; US 1990-510386 19900417; US 1990-583899 19900917; US 1990-583900 19900917.

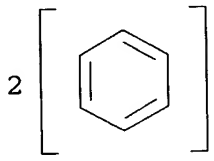
AB The title polyethers, bearing reactive end groups (e.g. allyl, propargyl) can be crosslinked to films useful as dielecs. in microelectronics. Thus, heating bisphenol AF, propargyl bromide, AcNMe2, and K2CO3 at 80.degree., adding decafluorobiphenyl, and heating at 80.degree. gave an oligomer (I) (d.p. .apprx.4). Spin coating a cyclohexanone soln. of I on glass, drying at 100.degree., and heating at 200-350.degree. gave a film with dielec. const. 2.55 and moisture absorption 0.15%.

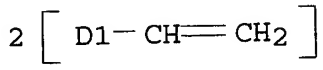
IT **138951-01-6P**
(thermosetting, manuf. of)

RN 138951-01-6 HCAPLUS

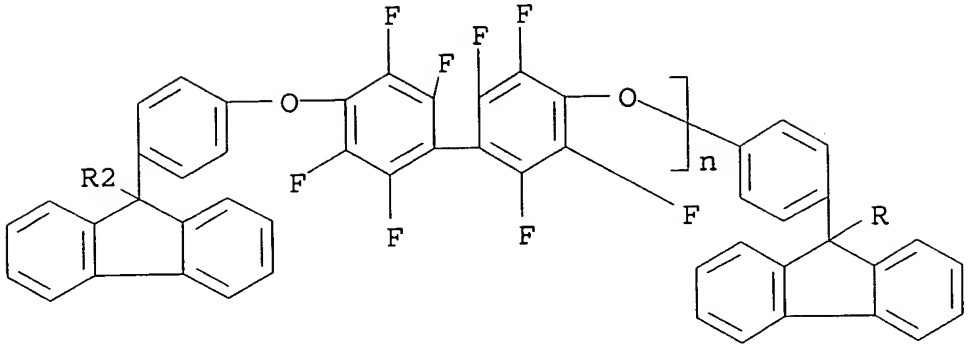
CN Poly[oxy(2,2',3,3',5,5',6,6'-octafluoro[1,1'-biphenyl]-4,4'-diyl)oxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene], .alpha.-[4-[9-[4-[(ethenylphenyl)methoxy]phenyl]-9H-fluoren-9-yl]phenyl]-.omega.-[(ethenylphenyl)methoxy]- (9CI) (CA INDEX NAME)

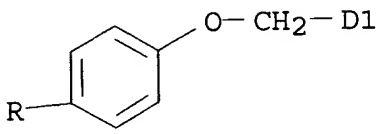
PAGE 1-A



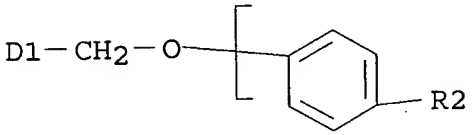


PAGE 2-A





PAGE 3-A



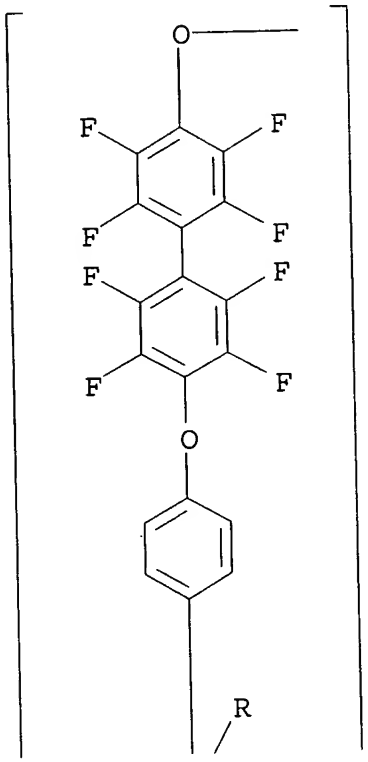
IT **138951-01-6P**
(thermosetting, manuf. of)

L46 ANSWER 12 OF 14 HCAPLUS COPYRIGHT 2003 ACS
1992:107051 Document No. 116:107051 Fluorinated poly(arylene ethers). Mercer, Frank W.; Sovish, Richard C. (Raychem Corp., USA). PCT Int. Appl. WO 9116369 A1 19911031, 31 pp. DESIGNATED STATES: W: CA, JP; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, NL, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1990-US7203 19901207. PRIORITY: US 1990-510353 19900417; US 1990-510386 19900417; US 1990-583899 19900917.

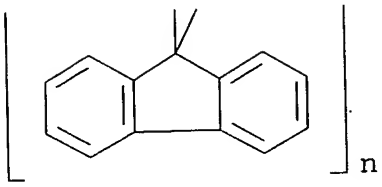
AB The title polymers, useful as dielec. materials in integrated circuit chips, contain F and are e.g., prepd. by polymg. compds. such as 4,4'-(hexafluoroisopropylidene)diphenol (I) and decafluorobiphenyl (II). Thus, heating I, II, AcNMe2, and K2CO3 at 80.degree., filtering to remove K2CO3 and KF, concg., cooling to room temp., and pouring in H2O pptd. polymer which, after workup and drying, was spin-cooled (in 2-ethoxyethyl ether) on a ceramic substrate to give a tough, flexible film with dielec. const. (0% relative humidity) 2.504.

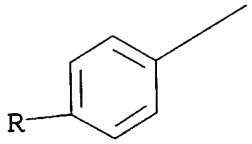
IT **136835-82-0P**
(prepn. of, dielec., for chips)
RN 136835-82-0 HCAPLUS
CN Poly[oxy(2,2',3,3',5,5',6,6'-octafluoro[1,1'-biphenyl]-4,4'-diyl)oxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A

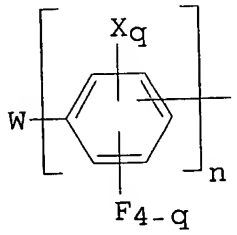




IT **136835-82-0P**
(prepn. of, dielec., for chips)

L46 ANSWER 13 OF 14 HCAPLUS COPYRIGHT 2003 ACS
1991:621267 Document No. 115:221267 Electronic article containing fluorinated poly(arylene ether) dielectric. Mercer, Frank W.; Goodman, Timothy D.; Lau, Aldrich N. K.; Vo, Lanchi P.; Sovish, Richard C. (Raychem Corp., USA). PCT Int. Appl. WO 9109071 A1 19910627, 39 pp. DESIGNATED STATES: W: CA, JP; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, NL, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1990-US7204 19901207. PRIORITY: US 1989-447750 19891208; US 1990-510353 19900417; US 1990-510386 19900417; US 1990-583900 19900917.

GI



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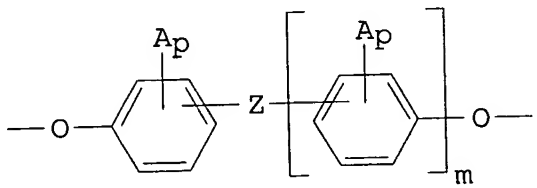

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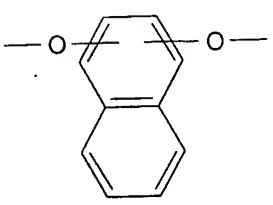

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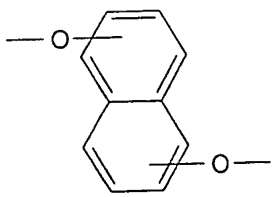

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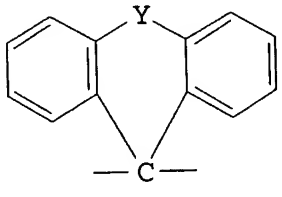


V

AB An electronic article has a dielec. fluorinated poly(arylene ether)

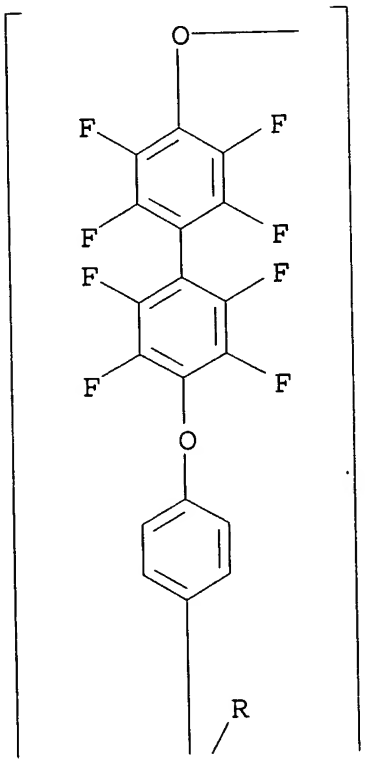
having a repeating unit I, where W = II, III, or IV; A = F, Cl, Br, CF3, Me, CH2CH:CH2, or Ph; Z = a single bond, CMe2, C(CF3)2, O, S, SO2, CO, PPh, C(Me)Ph, C(Ph)2, (CF2)1-6, or V; Y = O or a single bond; X = H, Cl, Br, CF3, Me, CH2CH:CH2, or Ph; p, m, q = 0-2; and n = 1 or 2.

IT **136835-82-0**
(dielec. layers from, in integrated and printed circuits)

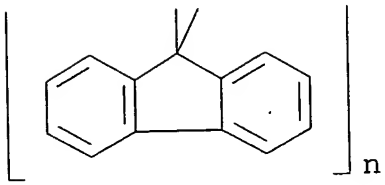
RN 136835-82-0 HCAPLUS

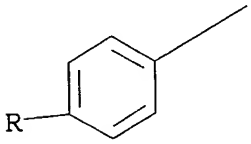
CN Poly[oxy(2,2',3,3',5,5',6,6'-octafluoro[1,1'-biphenyl]-4,4'-diyl)oxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A





IT **136835-82-0**
(dielec. layers from, in integrated and printed circuits)

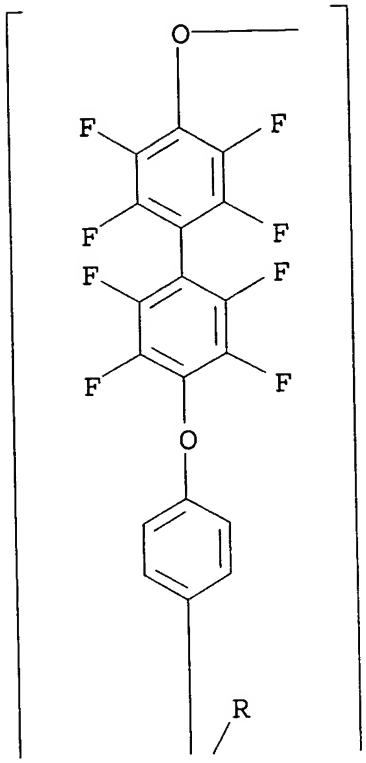
L46 ANSWER 14 OF 14 HCAPLUS COPYRIGHT 2003 ACS
1991:609427 Document No. 115:209427 Crosslinkable fluorinated polymer compositions and crosslinking agents. Mercer, Frank W.; Goodman, Timothy D.; Lau, Aldrich N. K.; Vo, Lanchi P. (Raychem Corp., USA). PCT Int. Appl. WO 9109081 A1 19910627, 42 pp. DESIGNATED STATES: W: CA, JP; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, NL, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1990-US7213 19901207. PRIORITY: US 1989-447750 19891208; US 1990-510353 19900417; US 1990-510386 19900417; US 1990-583897 19900917.

AB The compns., with high gel content, low dielec. const., and good solvent resistance and useful as potting compns. for integrated circuits, etc., comprise fluorinated poly(arylene ethers) OZ1Z(Z1)mO(Z2)n [Z = (fluorine-substituted) hydrocarbyl; Z1 = (halogen-substituted) phenylene; Z2 = fluorine-substituted aryl] and effective amt. of bistriazene compds. R1R2NN:N-p-C6H4-R5-p-C6H4-N:NNR3R4 (I; R1-R4 = H, Me, Et, Ph; R5 = O, SO2, O-p-C6H4-p-C6H4-O, residue of hydroquinone, bisphenol A, bisphenol AF, or bisphenol S) as crosslinking agents. Thus, a soln. contg. 83.33% 9,9-bis(4-hydroxyphenyl)fluorene-decafluorobiphenyl copolymer and 16.67% I (R1-R4 = Me, R5 = O-p-C6H4-p-C6H4-p-C6H4-O) was spin coated on a substrate and cured to give a crosslinked layer having gel content 93.7 .+-. 2.2%, vs. 3.3 .+-. 0.2% for a layer without I.

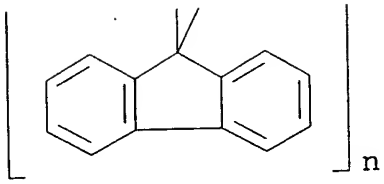
IT **136835-82-0P**
(prepn. of, crosslinking agents for, bistriazene compds. as)

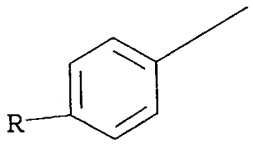
RN 136835-82-0 HCAPLUS
CN Poly[oxy(2,2',3,3',5,5',6,6'-octafluoro[1,1'-biphenyl]-4,4'-diyl)oxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A





IT **136835-82-0P**
(prepn. of, crosslinking agents for, bistriazene compds. as)

art involving inventor's own registry numbers

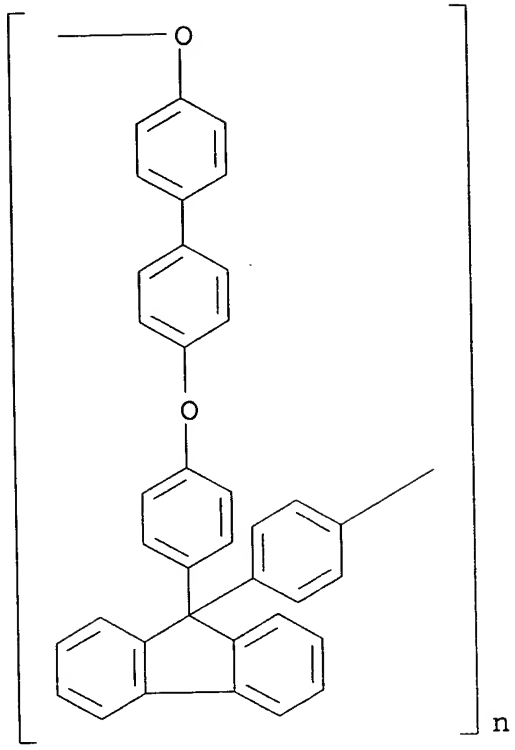
=> d 149 1-26 cbib abs hitstr hitrn

L49 ANSWER 1 OF 26 HCAPLUS COPYRIGHT 2003 ACS
2003:23491 Document No. 138:81944 Method of avoiding dielectric layer deterioration with a low dielectric constant in integrated circuit fabrication. Chang, Ting-Chang; Liu, Po-Tsun; Mor, Yi-Shien (Taiwan). U.S. Pat. Appl. Publ. US 2003008518 A1 20030109, 12 pp. (English). CODEN: USXXCO. APPLICATION: US 2001-681987 20010703.

AB The present invention is a method to avoid deterioration of a dielec. characteristic of a dielec. layer having a low dielec. const. (low k) during a stripping process. The method involves 1st forming a low k dielec. layer on the surface of a substrate of a semiconductor wafer. Then, a patterned photoresist layer is formed over the surface of the low k dielec. layer. The patterned photoresist layer is then used as a hard mask to perform an etching process on the low k dielec. layer. A stripping process is then performed to remove the patterned photoresist layer. Finally, a surface treatment was used on the low k dielec. layer to remove Si-OH bonds in the low k dielec. layer so as to avoid moisture absorption of the low k dielec. layer that causes deterioration of the dielec. characteristic.

IT **197923-27-6**, PAE-2
(method of avoiding dielec. layer deterioration with low dielec. const. in integrated circuit fabrication)

RN 197923-27-6 HCAPLUS
CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, PAE-2
(method of avoiding dielec. layer deterioration with low dielec. const. in integrated circuit fabrication)

L49 ANSWER 2 OF 26 HCAPLUS COPYRIGHT 2003 ACS
2002:599011 Document No. 138:31696 Adhesion improvement of thermoplastic isotropically conductive adhesive. Liong, S.; Wong, C. P.; Burgoyne, W. F., Jr. (Georgia Institute of Technology, School of Materials Science and Engineering, Atlanta, GA, 30332-0245, USA). Proceedings - International Advanced Packaging Materials Symposium, 8th, Stone Mountain, GA, United States, Mar. 3-6, 2002, 260-270. Institute of Electrical and Electronics Engineers: New York, N. Y. ISBN: 0-7803-7434-7 (English) 2002. CODEN: 69CYRY.

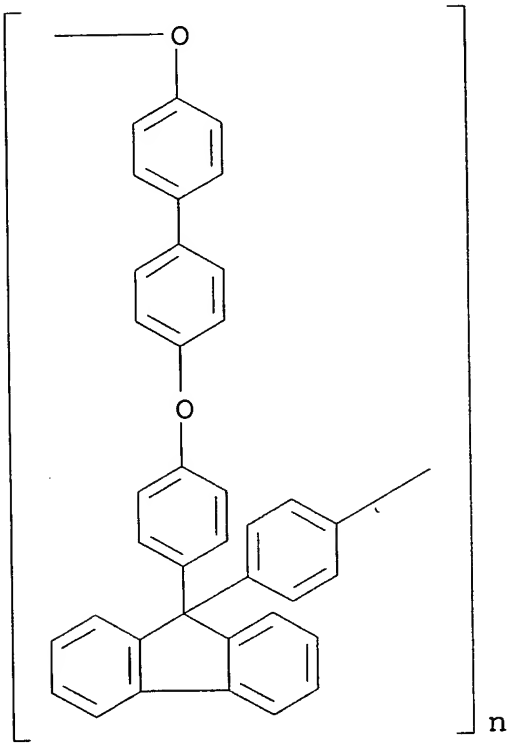
AB Generally, isotropically conductive adhesive formulations include epoxy resin as the polymeric matrix. Although epoxy has superior adhesion capability, its drawbacks include the tendency to absorb moisture and lack of reworkability (thermosetting polymer). A thermoplastic polymer with low moisture absorption (0.279 wt%), called polyarylene ether (PAE2), is used in isotropically conductive adhesive (ICA) formulation. Previous research work by Lu et. al. showed that the moisture absorbed into epoxy caused galvanic corrosion, which result in the formation of metal oxide. By a polymer with low moisture absorption, the amt. of water present in ICA will be small, and the corrosion rate and formation of metal oxide can be reduced. However, previous measurements of contact

resistance stability of PAE2-based ICAs showed that they are not stable on all surface finishes. It was detd. that for thermoplastic-based ICA, poor adhesion was the main mechanism for unstable contact resistance. Two methods of adhesion improvement will be evaluated in this work. The 1st is to use coupling agents and the 2nd is to blend the thermoplastic with epoxy. Both methods showed promise in improving the contact resistance stability of polyarylene ether based ICA.

IT **197923-27-6**, PAE2
(adhesion improvement of thermoplastic isotropically conductive adhesive)

RN 197923-27-6 HCAPLUS

CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, PAE2
(adhesion improvement of thermoplastic isotropically conductive adhesive)

L49 ANSWER 3 OF 26 HCAPLUS COPYRIGHT 2003 ACS

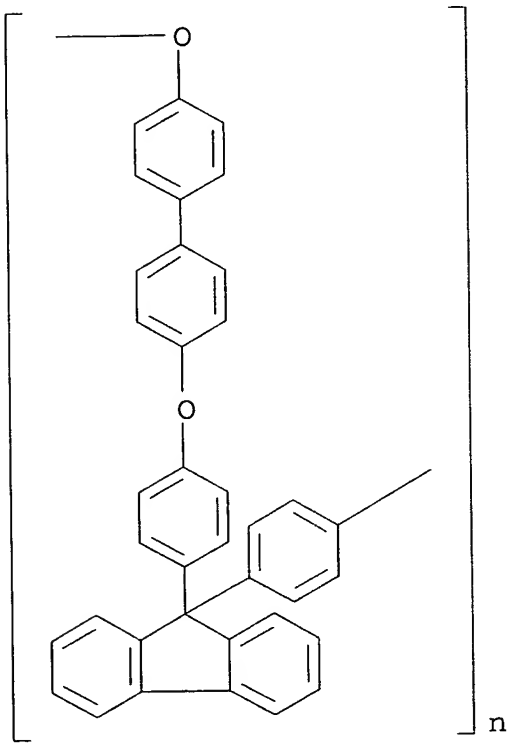
2002:401809 Document No. 136:378298 Isolated protection process of the copper metal layer with liner layer and etching stop layer. Liou, Jung-Shi; Yu, Jen-Hua (Taiwan Semiconductor Mfg Co. Ltd., Taiwan). Taiwan TW 406139 B 20000921, 11 pp. (Chinese). CODEN: TWXXA5. APPLICATION: TW 1999-88102268 19990212.

AB This invention provides an isolated protection process of the Cu metal, which comprises the steps of: (a) providing a semiconductor substrate having a Cu metal layer thereon; (b) forming a liner layer and a etching stop layer on the Cu metal layer sequentially, in which the adhesion of the liner layer toward the Cu is better than that of the etching stop layer; and (c) depositing an inter metal dielecs. or a passivation layer on the etching stop layer. This invention solves the problem of poor adhesion between the etching stop layer (such as SiON) and the Cu metal, and maintains excellent etching stop ability on the same time.

IT **197923-27-6**, PAE-2
(isolated protection process of copper metal layer with liner layer and etching stop layer)

RN 197923-27-6 HCAPLUS

CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, PAE-2
(isolated protection process of copper metal layer with liner layer and etching stop layer)

L49 ANSWER 4 OF 26 HCAPLUS COPYRIGHT 2003 ACS

2002:376033 Document No. 137:326165 Alternative to epoxy resin for application in isotropically conductive adhesive. Liong, Silvia; Wong, C. P. (School of Materials Science and Engineering Packaging

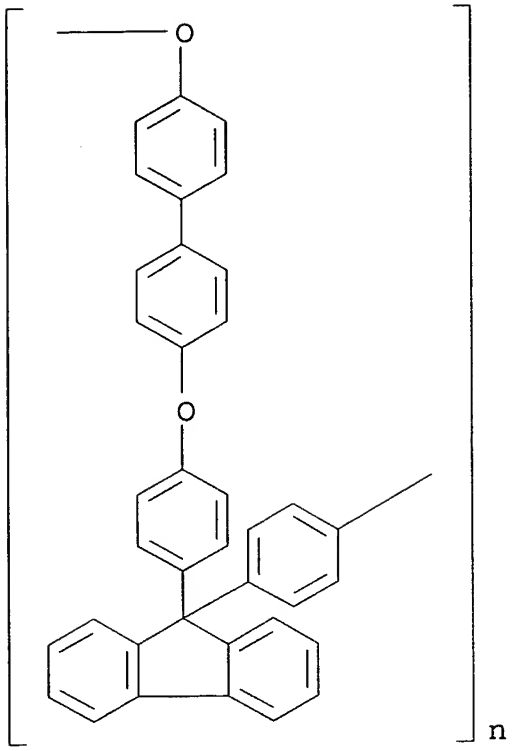
Research Center, Georgia Institute of Technology, Atlanta, GA, 30332-0245, USA). Proceedings - International Symposium on Advanced Packaging Materials: Processes, Properties and Interfaces, Braselton, GA, United States, Mar. 11-14, 2001, Meeting Date 2001, 13-18. Institute of Electrical and Electronics Engineers: New York, N. Y. ISBN: 0-930815-64-5 (English) 2001. CODEN: 69CPT9.

AB Isotropically conductive adhesive formulations predominantly include epoxy resin as the polymer matrix. Although epoxy has superior adhesion capability, one of its drawbacks is its tendency to absorb moisture and is non-reworkable. The presence of water in ICA interconnects causes contact resistance degrdn. by means of galvanic corrosion. In this study, an alternative polymer matrix having low moisture absorption and potential for reworkability, is used in isotropically conductive adhesive (ICA) formulation. The contact resistance of this group of ICAs will be measured throughout an accelerated aging process (85.degree.C/85%RH). Four point probe method will be used to measure the contact resistance on test coupons. Contact resistance stability of the ICAs will be compared among test coupons of various surface finishes (OSP, Sn/Pb, Sn, and Ni/Au). SEM analyses will be conducted on cross sections of coupons that fail early in the aging process and compare them with coupons that show stable resistance. Adhesion capability of this alternative polymer will be compared with epoxy on various surfaces: org. surface preservative (OSP), Sn/Pb, Sn, and Ni/Au using a die shear tester. Coupling agents will be incorporated into the ICA formulations and their effects on adhesion and contact resistance stability will be studied. Blends of epoxy and this alternative polymer will also be evaluated. Contact resistance measurements of thermoplastic-thermoset ICA blend will be collected throughout the aging process. Adhesion data of the ICA blend will also be collected using die shear tester. Such blend should produce a formulation that has good adhesion and low moisture uptake, which will be verified by the results from the aforementioned expts.

IT **197923-27-6**
(PAE 2; alternative to epoxy resin for application in isotropically conductive adhesive)

RN 197923-27-6 HCAPLUS

CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**
(PAE 2; alternative to epoxy resin for application in isotropically conductive adhesive)

L49 ANSWER 5 OF 26 HCAPLUS COPYRIGHT 2003 ACS
2002:290766 Document No. 136:302791 Method to eliminate dishing of copper interconnects by the use of a sacrificial oxide layer. Yu, Chen-Hua; Chang, Weng; Twu, Jih-Chung; Shih, Tsu (Taiwan Semiconductor Manufacturing Company, Taiwan). U.S. US 6372632 B1 20020416, 7 pp. (English). CODEN: USXXAM. APPLICATION: US 2000-490138 20000124.

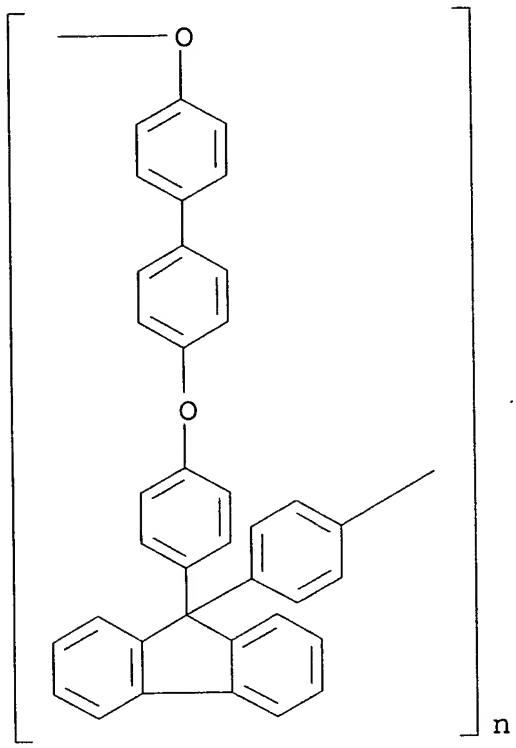
AB A method of forming a planarized metal interconnect comprising the following steps. A semiconductor structure is provided. A low K dielec. layer is formed over the semiconductor structure. A sacrificial layer over is formed over the low K dielec. layer. The sacrificial layer and low K dielec. layer are patterned to form a trench within the sacrificial layer and low K dielec. layer. A barrier layer is formed over the sacrificial layer, lining the trench side walls and bottom. Metal is deposited on the barrier layer to form a metal layer filling the lined trench and blanket filling the sacrificial layer covered low K dielec. layer. The metal layer and the barrier layer are planarized, exposing the upper surface of the sacrificial layer. The sacrificial layer is removed to form a planarized metal interconnect.

IT **197923-27-6**, PAE-2

(method to eliminate dishing of copper interconnects by use of a sacrificial oxide layer)

RN 197923-27-6 HCAPLUS

CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, PAE-2
(method to eliminate dishing of copper interconnects by use of a sacrificial oxide layer)

L49 ANSWER 6 OF 26 HCAPLUS COPYRIGHT 2003 ACS

2001:926161 Document No. 137:21122 Development of thermoplastic isotropically conductive adhesive. Liong, Silvia; Wong, C. P. (Packaging Research Center Georgia Institute of Technology, School of Materials Science and Engineering, Atlanta, GA, 30332-0245, USA). Proceedings - Electronic Components & Technology Conference, 51st, 586-592 (English) 2001. CODEN: PETCES. Publisher: Institute of Electrical and Electronics Engineers.

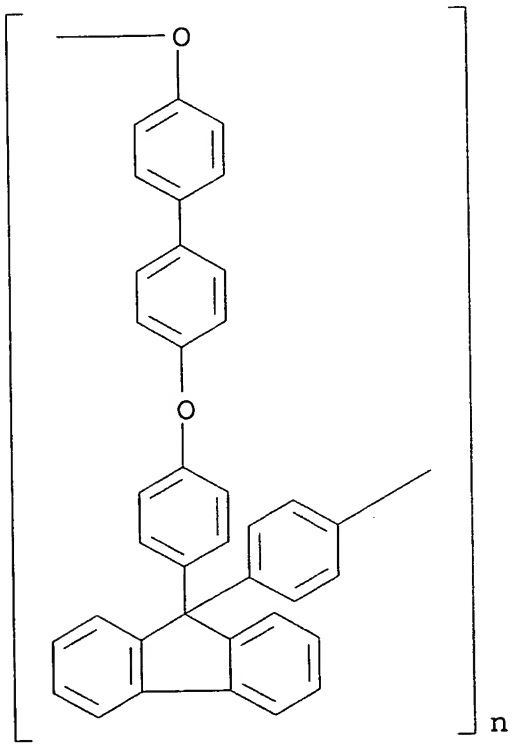
AB Isotropically conductive adhesive (ICA) formulations usually include epoxy resin as the polymeric matrix. Although epoxy has superior adhesion capability, one of its drawbacks is its tendency to absorb moisture. As a result, a finite amt. of water may accumulate at the interface of ICA and contact pads. Previous studies have shown that the presence of water in ICA interconnects causes contact resistance degrdn. at the interface by means of galvanic corrosion. In this

study, an alternative thermoplastic polymeric matrix with low moisture absorption is used in ICA formulation. Presence of residual solvent in the thermoplastic ICA interconnects increased their contact resistance values. Adhesion of the thermoplastic polymer on Cu/org. solderability preservative (OSP) surface was better than Sn/Pb, Sn, or Ni/Au, and that trend correlated with contact resistance stability after aging. Addn. of coupling agents and plasticizer improved adhesion of the thermoplastic polymer, esp. on Ni/Au surface. A blend of thermoplastic and thermosetting polymers was evaluated for ICA application, and it was shown that it is a feasible approach for improving contact resistance stability.

IT **197923-27-6**, PAE 2
(formulation development of thermoplastic isotropically conductive adhesive and their blends with thermosetting polymers)

RN 197923-27-6 HCAPLUS

CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **187591-29-3**, 9,9-Bis(4-hydroxyphenyl)fluorene disodium salt-4,4'-dibromobiphenyl copolymer
(thermosetting; formulation development of thermoplastic isotropically conductive adhesive and their blends with thermosetting polymers)

RN 187591-29-3 HCAPLUS

CN Phenol, 4,4'-(9H-fluoren-9-ylidene)bis-, disodium salt, polymer with

4,4'-dibromo-1,1'-biphenyl (9CI) (CA INDEX NAME)

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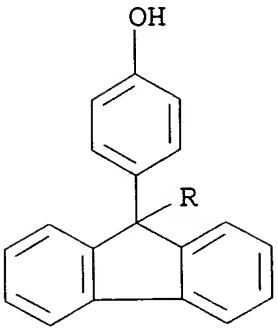
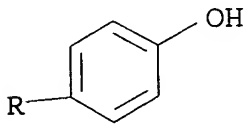
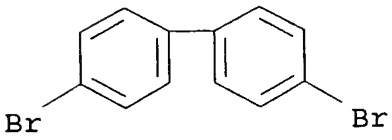




2 Na

CM 2

CRN 92-86-4
CMF C12 H8 Br2



IT **197923-27-6**, PAE 2
(formulation development of thermoplastic isotropically conductive adhesive and their blends with thermosetting polymers)

IT **187591-29-3**, 9,9-Bis(4-hydroxyphenyl)fluorene disodium salt-4,4'-dibromobiphenyl copolymer
(thermosetting; formulation development of thermoplastic isotropically conductive adhesive and their blends with

thermosetting polymers)

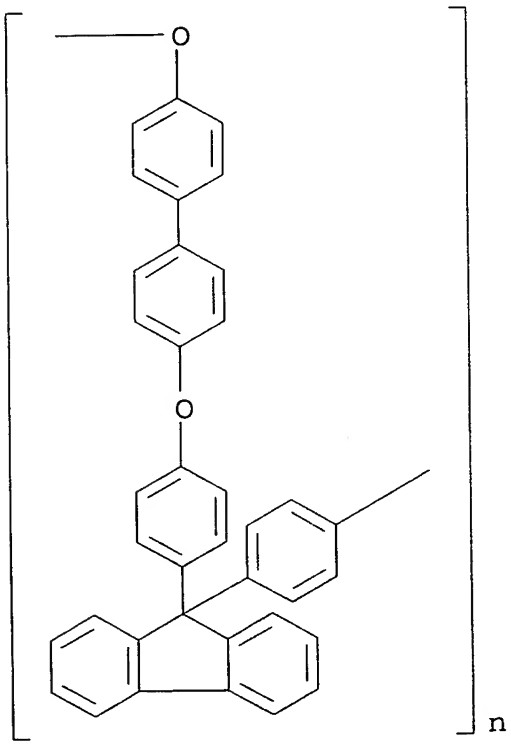
L49 ANSWER 7 OF 26 HCAPLUS COPYRIGHT 2003 ACS
2001:630836 Document No. 135:196438 Method of forming dielectric material suitable for microelectronic circuits. Tu, King-ning; Xu, Yuhuan; Zhao, Bin (Conexant Systems, Inc., USA). U.S. US 6280794 B1 20010828, 7 pp. (English). CODEN: USXXAM. APPLICATION: US 1999-432046 19991101. PRIORITY: US 1999-PV123554 19990310.

AB An improved dielec. material having pores formed therein and a method for forming the material are disclosed. The material is formed of a polymer, e.g., polyarylene ether. Pores within the polymer are formed by forming solid org. particles (e.g., rosin) within the polymer and eventually vaporizing the particles to form pores within the polymer.

IT **197923-27-6**, PAE 2
(method of forming dielec. material suitable for microelectronic circuits)

RN 197923-27-6 HCAPLUS

CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, PAE 2
(method of forming dielec. material suitable for microelectronic circuits)

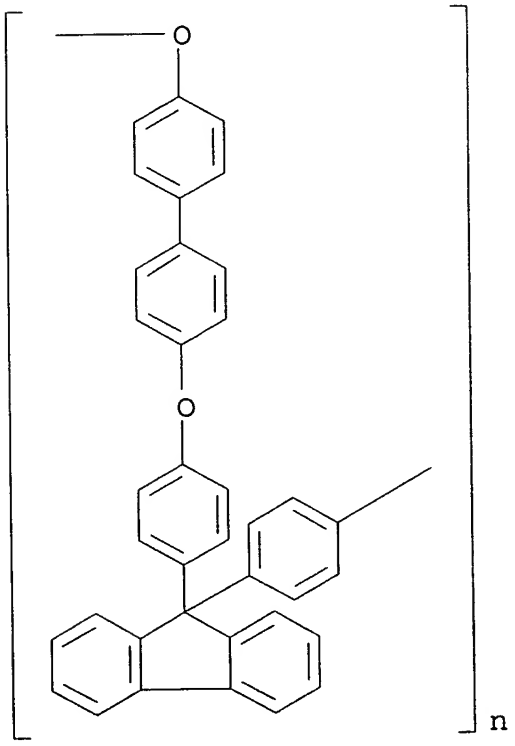
L49 ANSWER 8 OF 26 HCAPLUS COPYRIGHT 2003 ACS
2001:560045 Document No. 135:130811 Method for forming dual damascene structure for a semiconductor device. Huang, Yimin (United Microelectronics Corp., Taiwan). U.S. US 6268283 B1 20010731, 9 pp. (English). CODEN: USXXAM. APPLICATION: US 1999-248159 19990209.

AB An improved method for forming a dual damascene structure is described. A via opening of the dual damascene structure is formed in a dielec. layer. A non-conformal cap layer is then formed on the substrate before the step of defining the photoresist layer. The non-conformal cap layer only covers the top region of the trench but does not fill the trench. A patterned photoresist layer is then formed on the substrate followed by an etching procedure so as to form a trench. The photoresist layer is then removed. The trench and via opening are filled with a conductive layer. Thereafter, redundant portions of the conductive layer are removed by a planarization process.

IT **197923-27-6**, PAE 2
(method for forming dual damascene structure for a semiconductor device)

RN 197923-27-6 HCAPLUS

CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, PAE 2
(method for forming dual damascene structure for a semiconductor

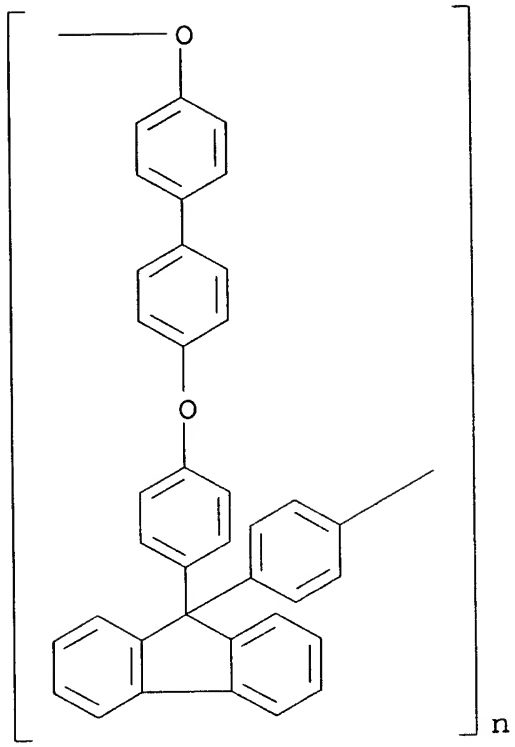
device)

L49 ANSWER 9 OF 26 HCAPLUS COPYRIGHT 2003 ACS
2001:499837 Document No. 135:85582 Process for low-constant dielectric with metal dummy plugs for stress relief by providing thermal conductivity. Yu, Chen-hua; Jeng, Shwangming (Taiwan Semiconductor Manufacturing Company, Taiwan). U.S. US 6258715 B1 20010710, 9 pp. (English). CODEN: USXXAM. APPLICATION: US 1999-228125 19990111.

AB Low dielec. inter-metal dielec. (IMD) layers made of H silsesquioxane (HSQ) or Me silsesquioxane (MSQ) spin-on-glass do not have good thermal cond. as compared to regular oxides and the adhesion of HSQ or MSQ is worse than that of oxide to oxide layers. Methods are disclosed and illustrated to improve the heat transfer by providing metal dummy plugs under and/or around bonding pads or between metalization layers. The arrangement and nos. of dummy plugs depends on the heat to be transferred and varies with the application. Good thermal cond. is of particular importance because the effects of high local temp. around bonding pads during chip bonding results in thermal stress and delamination of the IMD layers. The use of bonding pads provides other benefits as well.

IT **197923-27-6**, PAE-2
(process for low-const. dielec. with metal dummy plugs for stress relief by providing thermal cond.)

RN 197923-27-6 HCAPLUS
CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, PAE-2
(process for low-const. dielec. with metal dummy plugs for stress relief by providing thermal cond.)

L49 ANSWER 10 OF 26 HCAPLUS COPYRIGHT 2003 ACS
2001:189821 Document No. 134:347020 High-density plasma patterning of low dielectric constant polymers: A comparison between polytetrafluoroethylene, parylene-N, and poly(arylene ether). Standaert, T. E. F. M.; Matsuo, P. J.; Li, X.; Oehrlein, G. S.; Lu, T.-M.; Gutmann, R.; Rosenmayer, C. T.; Bartz, J. W.; Langan, J. G.; Entley, W. R. (Department of Physics, State University of New York at Albany, Albany, NY, 12222, USA). Journal of Vacuum Science & Technology, A: Vacuum, Surfaces, and Films, 19(2), 435-446 (English) 2001. CODEN: JVTAD6. ISSN: 0734-2101. Publisher: American Institute of Physics.

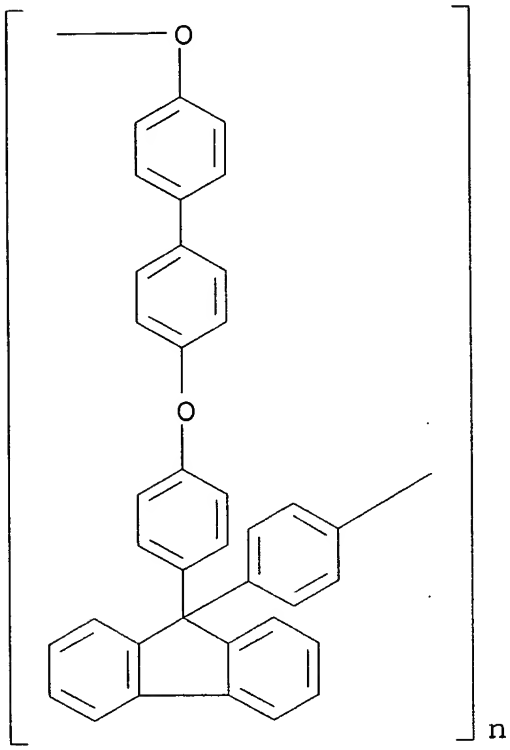
AB The pattern transfer of SiO2 hard masks into polytetrafluoroethylene, parylene-N, and poly(arylene ether) (PAE-2) was characterized in an inductively coupled plasma source. Selected results obtained with blanket parylene-AF4 films are included. These dielecs. offer a relatively low dielec. const. (k.apprx.2-3) and are candidate materials for use as intra- and interlayer dielecs. for the next generations of high-speed electronic devices. Successful patterning conditions were identified for Ar/O2 and N2/O2 gas mixts. The formation of straight sidewalls in Ar/O2 discharges relies on the redeposition of O-deficient etch products on the

feature sidewall. Also, the etch rates of parylene-N, parylene-F, and PAE-2 for blanket and patterned films could be captured by a semiempirical surface coverage model, which balances the adsorption rate of O and the ion-induced desorption rate of oxygenated etch products.

IT **197923-27-6**, PAE-2
(high-d. plasma patterning of low dielec. const. polymers with comparison between polytetrafluoroethylene, parylene-N, and poly(arylene ether))

RN 197923-27-6 HCAPLUS

CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, PAE-2
(high-d. plasma patterning of low dielec. const. polymers with comparison between polytetrafluoroethylene, parylene-N, and poly(arylene ether))

L49 ANSWER 11 OF 26 HCAPLUS COPYRIGHT 2003 ACS

2000:873445 Document No. 134:43143 Composites of powdered fillers and polymer matrix and manufacture thereof. Holl, Richard A. (Holl Technologies Company, USA). U.S. US 6159264 A 20001212, 13 pp. (English). CODEN: USXXAM. APPLICATION: US 1999-345813 19990702.

AB Composite materials comprising .gtoreq.60 vol.%, preferably 70 vol.%, of particles of finely powd. filler material in a matrix of

poly(arylene ether) material are made by forming a mixt. of the components into specified bodies, and then heating and pressing the bodies to a temp. sufficient to melt the polymer and to a pressure sufficient to disperse the melted polymer into the interstices between the filler particles. These polymer materials are effective as bonding materials only when the solids content is .gtoreq.60 vol.%, since with lower contents the resultant bodies are too friable. To obtain as complete a dispersion of the components as possible they are individually dispersed in a liq. medium contg. the polymer together with necessary additives, each mixt. being ground if required to obtain a desired particle size, the mixts. are mixed, again ground, sepd. from the liq. dispersion medium, and formed into green articles. The green articles are heated and pressed as described above. Mixts. of different filler materials are used to tailor the elec. and phys. properties of the final materials. The articles preferably are substrates for use in electronic circuits.

IT **187591-30-6 188432-91-9 188432-97-5**
(composites of powd. fillers and polymer matrix and manuf. thereof)

RN 187591-30-6 HCAPLUS

RN 188432-91-9 HCAPLUS

CN Phenol, 4,4'-(9H-fluoren-9-ylidene)bis-, polymer with 4,4'-dibromo-1,1'-biphenyl (9CI) (CA INDEX NAME)

CM 1

CRN 3236-71-3
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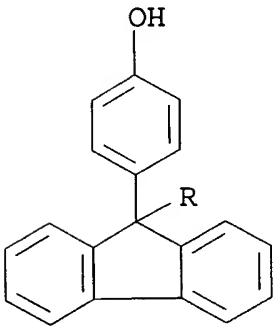
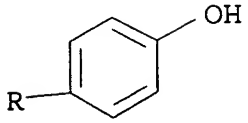
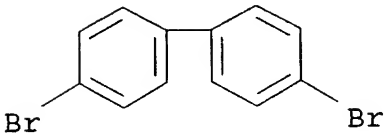




CM 2

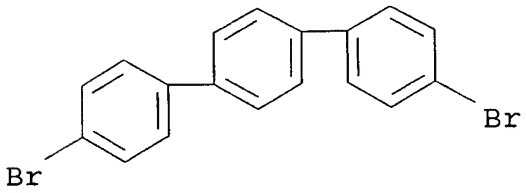
CRN 92-86-4
CMF C12 H8 Br2



RN 188432-97-5 HCAPLUS
CN Phenol, 4,4'-(9H-fluoren-9-ylidene)bis-, polymer with 4,4'-dibromo-1,1'-biphenyl and 4,4''-dibromo-1,1':4',1''-terphenyl (9CI) (CA INDEX NAME)

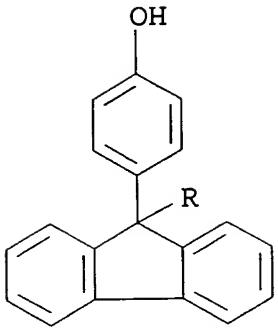
CM 1

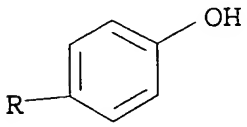
CRN 17788-94-2
CMF C18 H12 Br2



CM 2

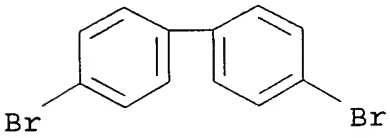
CRN 3236-71-3
CMF C25 H18 O2





CM 3

CRN 92-86-4
CMF C12 H8 Br2



IT **187591-30-6 188432-91-9 188432-97-5**
(composites of powd. fillers and polymer matrix and manuf. thereof)

L49 ANSWER 12 OF 26 HCAPLUS COPYRIGHT 2003 ACS
2000:536301 Document No. 134:148198 Properties and chemical-mechanical polishing characteristics of low dielectric constant polymer films: PAE-2 and Flare 2.0. Chen, Wen-Chang; Yen, Cheng Tyng; Dai, Bau-Tong; Tsai, Ming-Shih (Department of Chemical Engineering, National Taiwan University, Taipei, 106, Taiwan). Journal of the Chinese Institute of Chemical Engineers, 31(3), 253-260 (English) 2000. CODEN: JCICAP. ISSN: 0368-1653. Publisher: Chinese Institute of Chemical Engineers.

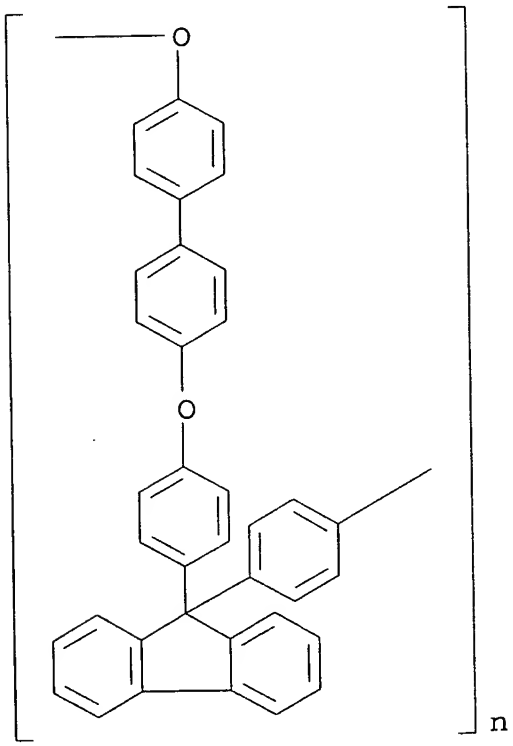
AB The film properties and chem.-mech. polishing (CMP) characteristics of two different low dielec. const. poly (arylene ethers): PAE-2 and Flare 2.0 were studied. The mol. structure, thermal-stress properties, and dielec. const. of the polymer films were characterized. The removal rates and surface properties of the

polished films were investigated by the following parameters: structural rigidity, types of abrasives, and various charge status of surfactants (Triton X-100 and sodium dodecyl sulfate). The exptl. results show that the mech. properties of polymer films, the abrasive hardness and surfactant affected significantly the CMP characteristics. The mech. property of the PAE-2 film was inferior to the Flare 2.0 film and thus a higher polishing rate was found for the PAE-2 film than the Flare 2.0 film. The addn. of surfactants into the slurries significantly modified the surface contact area and the electrostatic force between the abrasive and the polymer film. Therefore, the polishing rate was affected by surfactants.

IT **197923-27-6**, Pae 2
(properties and chem.-mech. polishing characteristics of low dielec. const. polyarylene ether films)

RN 197923-27-6 HCAPLUS

CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, Pae 2
(properties and chem.-mech. polishing characteristics of low dielec. const. polyarylene ether films)

L49 ANSWER 13 OF 26 HCAPLUS COPYRIGHT 2003 ACS

2000:351222 Document No. 132:348689 Low dielectric nanoporous polymer films and production thereof using a combination high- and

low-boiling solvents. O'Neill, Mark Leonard; Robeson, Lloyd Mahlon; Burgoyne, William Franklin Jr.; Langsam, Michael (Air Products and Chemicals, Inc., USA). Eur. Pat. Appl. EP 1002830 A2 20000524, 17 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 1999-122008 19991111. PRIORITY: US 1998-196452 19981119.

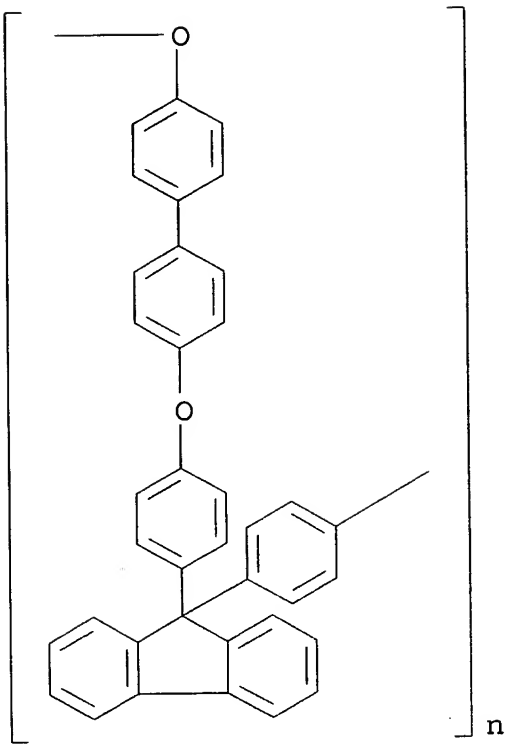
AB Title films are prepd. by (a) dissolving polymer in at least two solvents in which the low- and the high-boiling solvents have a difference in their resp. b.ps. .gtoreq.50.degree.; (b) forming a film of the polymer preferably by spin casting the soln. on a substrate; (c) removing a predominant amt. of the low-boiling solvent; (d) contacting the film with a nonsolvent for the polymer, which is miscible with the low- and high-boiling solvents to induce phase inversion in the film; (e) forming a film .ltoreq.10-.mu. thick having an av. pore size .ltoreq.30 nm. Preferably the polymer is selected from poly(arylene ethers), polyimides, poly(phenylquinoxalines), substituted poly(p-phenylenes), poly(benzobisoxazoles), polybenzimidazoles, polytriazoles and mixts. thereof. Preferably, the high-boiling solvent has b.p. .gtoreq.150.degree., and the low-boiling solvent has b.p. .ltoreq.100.degree.. Thus, a benzophenonetetracarboxylic dianhydride-diaminomesitylene polyimide having Mn .apprx.1-3x104 g/mol was dissolved in cyclohexanone (I) to produce a 10 wt.% solids soln., heated to 100.degree. and stirred with a di-Ph ether (II)-THF mixt. which was added slowly to produce a clear amber soln. of 5 wt.% solids in 50:25:25 I-II-THF. The soln. was spun on a wafer, UV cured, and quickly immersed in a phase inversion soln. to structure the film and remove the solvents. The film had dielec. const. 1.93, porosity 54%, and pore size <30 nm.

IT **187591-30-6 197923-27-6**, PAE 2
(UV-crosslinked; low dielec. nanoporous polymer films and prodn. thereof using combination of high- and low-boiling solvents)

RN 187591-30-6 HCAPLUS

RN 197923-27-6 HCAPLUS

CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **187591-30-6 197923-27-6**, PAE 2
(UV-crosslinked; low dielec. nanoporous polymer films and prodn. thereof using combination of high- and low-boiling solvents)

L49 ANSWER 14 OF 26 HCAPLUS COPYRIGHT 2003 ACS
2000:81264 Document No. 132:188301 Characterization of thin dielectric films as copper diffusion barriers using triangular voltage sweep. Cohen, S. A.; Liu, J.; Gignac, L.; Ivers, T.; Armbrust, D.; Rodbell, K. P.; Gates, S. M. (IBM T. J. Watson Research Center, Yorktown Heights, NY, 10598, USA). Materials Research Society Symposium Proceedings, 565(Low-Dielectric Constant Materials V), 189-196 (English) 1999. CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials Research Society.

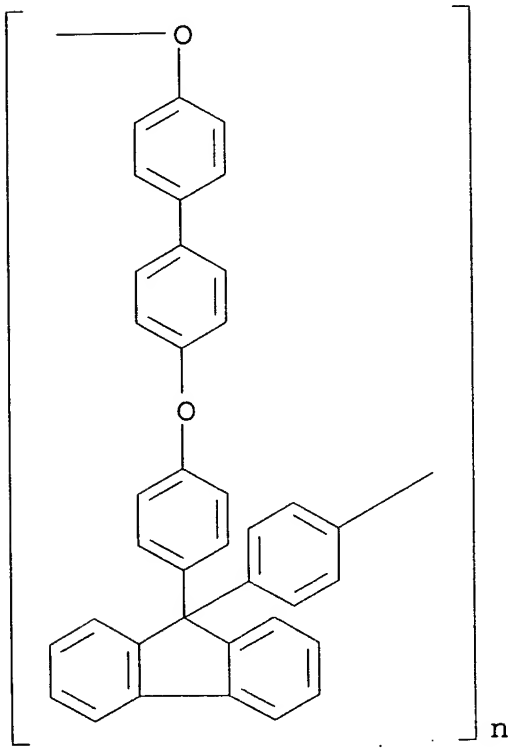
AB As technol. progresses, the need for thinner Cu diffusion barrier caps is becoming more important, and it is advantageous if these barriers have low dielec. consts. (.kappa.). Towards this end, we characterized Cu penetration in several thin (35 nm to 70 nm) dielecs., including silicon nitrides, silicon oxynitrides, an amorphous hydrogenated carbon film, and a Me silsesquioxane layer. Metal Insulator Silicon (MIS) structures were used as the test vehicle. The barrier dielecs. were deposited on 100 nm thermal oxide which was grown on 2 .OMEGA.-cm, n-type Si wafers. After the deposition of 50 nm TEOS capping layers, both Al and Cu dots were evapd. on each wafer through a mask. Both Al and Cu dot samples were stressed at +2.7 MV/cm at 300.degree.C for 10 min. For Cu

dots, the applied stress pushed Cu ions into the dielec. stack. Stressing Al dots characterized the effects of the stress on the dielec. stacks and the quantity of Na ions in the films. Since C-V shifts are subject to stress-related instabilities in the interfaces as well as within the dielecs. themselves, triangular voltage sweep (TVS) was used after the applied stress to measure the concn. of Cu which reached the underlying thermal oxide film. The sensitivity of the TVS test with the structures used is about 5.times.109/cm2. Secondary ion mass spectroscopy (SIMS) analyses were performed on some of these samples to verify the elec. results.

IT **197923-27-6**, PAE-2
(characterization of thin dielec. films as copper diffusion barriers using triangular voltage sweep)

RN 197923-27-6 HCAPLUS

CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, PAE-2
(characterization of thin dielec. films as copper diffusion barriers using triangular voltage sweep)

L49 ANSWER 15 OF 26 HCAPLUS COPYRIGHT 2003 ACS

2000:81263 Document No. 132:201558 Evaluation of copper penetration in low-.kappa. polymer dielectrics by bias-temperature stress. Loke, Alvin L. S.; Wong, S. Simon; Talwalkar, Niranjan A.; Wetzel, Jeffrey

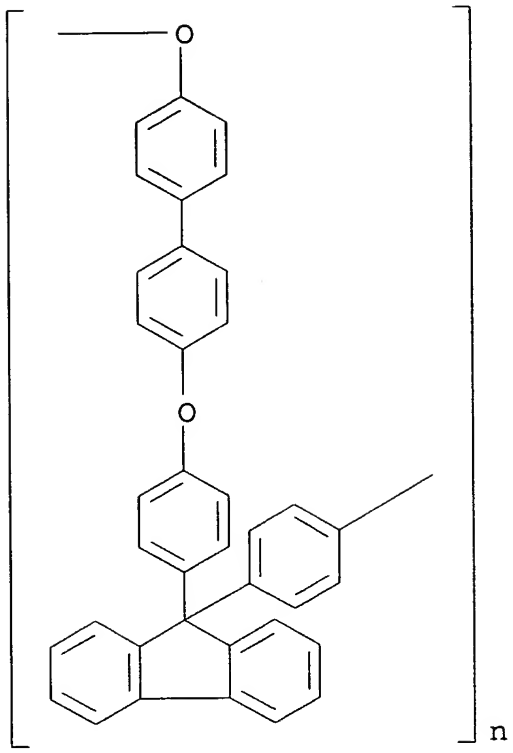
T.; Townsend, Paul H.; Tanabe, Tsuneaki; Vrtis, Raymond N.; Zussman, Melvin P.; Kumar, Devendra (Center for Integrated Systems, Stanford University, Stanford, CA, 94305, USA). Materials Research Society Symposium Proceedings, 565(Low-Dielectric Constant Materials V), 173-187 (English) 1999. CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials Research Society.

AB The industry is strongly interested in integrating low-.kappa. dielecs. with Damascene copper. Otherwise, with conventional materials, interconnects cannot continue to scale without limiting circuit performance. Integration of copper wiring with silicon dioxide (oxide) requires barrier encapsulation since copper drifts readily in oxide. An important aspect of integrating copper wiring with low-.kappa. dielecs. is the drift behavior of copper ions in these dielecs., which will directly impact the barrier requirements and hence integration complexity. This work evaluates and compares the copper drift properties in six low-.kappa. org. polymer dielecs.: parylene-F; benzocyclobutene; fluorinated polyimide; an arom. hydrocarbon; and two varieties of poly(arylene ether). Copper/oxide/polymer/oxide/silicon capacitors are subjected to bias-temp. stress to accelerate penetration of copper from the gate electrode into the polymer. The oxide-sandwiched dielec. stack is used to overcome interface instabilities occurring when a low-.kappa. dielec. is in direct contact with either the gate metal or silicon substrate. The copper drift rates in the various polymers are estd. by elec. techniques, including capacitance-voltage, current-voltage, and current-time measurements. Results correlate well with time-to-breakdown obtained by stressing the capacitor dielecs. Our study shows that copper ions drift readily into fluorinated polyimide and poly(arylene ether), more slowly into parylene-F, and even more slowly into benzocyclobutene. A qual. comparison of the chem. structures of the polymers suggests that copper drift in these polymers may possibly be retarded by increased crosslinking and enhanced by polarity in the polymer.

IT **197923-27-6**, PAE-2
(evaluation of copper penetration in low-.kappa. polymer dielecs. by bias-temp. stress)

RN 197923-27-6 HCAPLUS

CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, PAE-2
(evaluation of copper penetration in low-.kappa. polymer dielecs. by bias-temp. stress)

L49 ANSWER 16 OF 26 HCAPLUS COPYRIGHT 2003 ACS
2000:2038 Document No. 132:130474 Compatibility of the low-dielectric-constant poly(arylether) with the electroless copper deposition solution. Hsu, D. T.; Iskandar, M.; Shi, F. G.; Lopatin, S.; Shacham-Diamand, Y.; Tong, H. Y.; Zhao, B.; Brongo, M.; Vasudev, P. K. (Department of Chemical Engineering and Biochemical Engineering and Materials Science, University of California, Irvine, CA, 92697-2575, USA). Journal of the Electrochemical Society, 146(12), 4565-4568 (English) 1999. CODEN: JESOAN. ISSN: 0013-4651. Publisher: Electrochemical Society.

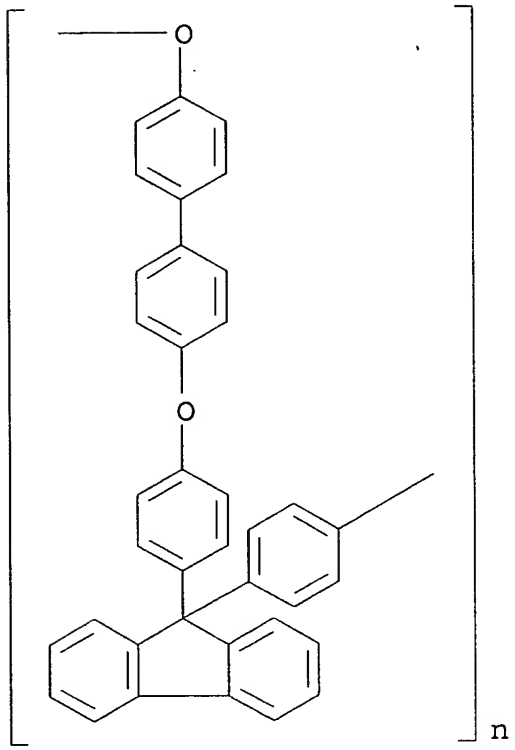
AB Possible interactions between nonfluorinated poly(arylether) thin films and the recently developed electroless Cu deposition soln. are investigated. The results show that there is no chem. reaction between this low-dielec.-const. polymer and the electroless Cu deposition soln. However, a significant change in thickness as well as refractive index is induced by the electroless soln. conditions. It is demonstrated that higher temps. can alleviate the electroless Cu soln.-induced effects as far as the glass transition temp., the coeff. of thermal expansion, and refractive index are concerned.

IT **197923-27-6**, PAE-2
(compatibility of low-dielec.-const. poly(arylether) with

electroless copper deposition soln.)

RN 197923-27-6 HCAPLUS

CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, PAE-2
(compatibility of low-dielec.-const. poly(arylether) with electroless copper deposition soln.)

L49 ANSWER 17 OF 26 HCAPLUS COPYRIGHT 2003 ACS

1999:751764 Document No. 132:4117 Polyarylene ether coating for semiconductor printed circuit plate. Tamura, Nobuhisa; Kita, Kohei (Asahi Chemical Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11323249 A2 19991126 Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-153895 19980519.

AB Title coating comprises a polyarylene ether and a bibenzyl compd. Thus, 9,9-bis(4-hydroxyphenyl)fluorene 35.04 g was polymd. with 4,4'-dibromobiphenyl 31.20 g to give a polymer, 10 g of which was reacted with 2,3-dimethyl-2,3-diphenylbutane 2g to give a crosslinked polymer with.

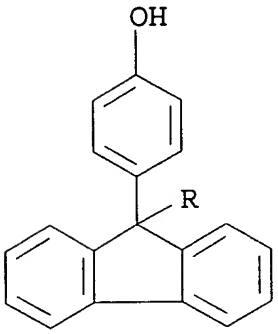
IT **187591-30-6P 188432-91-9P**, 9,9-Bis(4-hydroxyphenyl)fluorene-4,4'-dibromobiphenyl copolymer
(polyarylene ether coating for semiconductor printed circuit board)

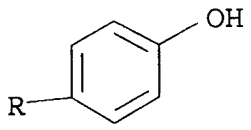
RN 187591-30-6 HCAPLUS

RN 188432-91-9 HCAPLUS
CN Phenol, 4,4'-(9H-fluoren-9-ylidene)bis-, polymer with 4,4'-dibromo-1,1'-biphenyl (9CI) (CA INDEX NAME)

CM 1

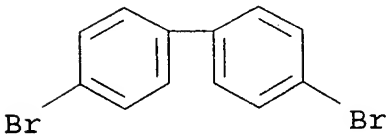
CRN 3236-71-3
CMF C25 H18 O2





CM 2

CRN 92-86-4
CMF C12 H8 Br2



IT **187591-30-6P 188432-91-9P**, 9,9-Bis(4-hydroxyphenyl)fluorene-4,4'-dibromobiphenyl copolymer
(polyarylene ether coating for semiconductor printed circuit board)

L49 ANSWER 18 OF 26 HCAPLUS COPYRIGHT 2003 ACS
1999:751500 Document No. 131:352341 Purification of aromatic polyethers and coatings therefrom. Kuroki, Masakatsu; Kita, Kohei (Asahi Chemical Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho

JP 11322922 A2 19991126 Heisei, 8 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 1998-153899 19980519.

AB The polyethers, useful for elec. insulators for semiconductor devices, are purified by treating with org. acids to remove metal impurities. Thus, an anisole soln. contg. 2 g 2,6-diphenylphenol-2-phenylphenol copolymer (purified by refluxing in AcOH-contg. PhMe) and 0.3 g 2,3-dimethyl-2,3-diphenylbutane was applied on a glass plate and cured to give a thin coating showing good resistance to N-methylpyrrolidone and wt. redn. 0.8% per h during heating at 400.degree. for 2 h. An Al-coated Si substrate coated with the copolymer showed low dielec. const.

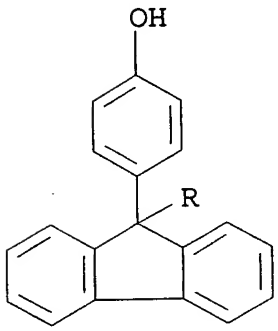
IT **187591-29-3P**, 9,9-Bis(4-hydroxyphenyl)fluorene disodium salt-4,4'-dibromobiphenyl copolymer
(cardo; purifn. of arom. polyethers for elec. insulating coatings for semiconductor devices)

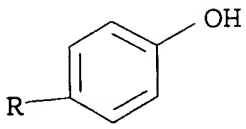
RN 187591-29-3 HCAPLUS

CN Phenol, 4,4'-(9H-fluoren-9-ylidene)bis-, disodium salt, polymer with 4,4'-dibromo-1,1'-biphenyl (9CI) (CA INDEX NAME)

CM 1

CRN 59507-02-7
CMF C25 H18 O2 . 2 Na

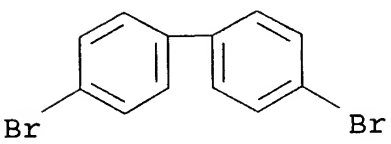




●2 Na

CM 2

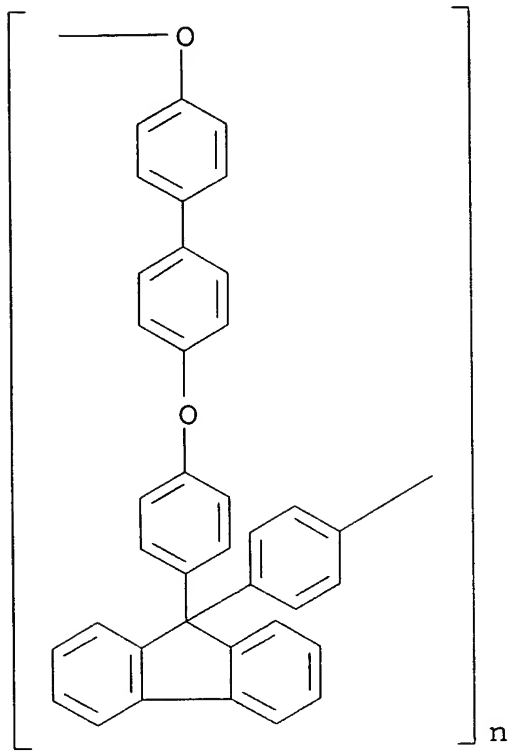
CRN 92-86-4
CMF C12 H8 Br2



IT **187591-30-6P**, 9,9-Bis(4-hydroxyphenyl)fluorene disodium salt-4,4'-dibromobiphenyl copolymer, sru
(purifn. of arom. polyethers for elec. insulating coatings for semiconductor devices)
RN 187591-30-6 HCAPLUS
IT **187591-29-3P**, 9,9-Bis(4-hydroxyphenyl)fluorene disodium salt-4,4'-dibromobiphenyl copolymer
(cardo; purifn. of arom. polyethers for elec. insulating coatings for semiconductor devices)
IT **187591-30-6P**, 9,9-Bis(4-hydroxyphenyl)fluorene disodium salt-4,4'-dibromobiphenyl copolymer, sru
(purifn. of arom. polyethers for elec. insulating coatings for semiconductor devices)

L49 ANSWER 19 OF 26 HCAPLUS COPYRIGHT 2003 ACS
1999:736732 Document No. 132:71921 Electrical reliability issues of integrating thin Ta and TaN barriers with Cu and low-K dielectric. Wu, Zhen-Cheng; Wang, Chau-Chiung; Wu, Ren-Guay; Liu, Yu-Lin; Chen, Peng-Sen; Zhu, Zhe-Min; Chen, Mao-Chieh; Chen, Jiann-Fu; Chang, Chung-I.; Chen, Lai-Juh (Department of Electronics Engineering, National Chiao-Tung University, Hsinchu, Taiwan). Journal of the Electrochemical Society, 146(11), 4290-4297 (English) 1999. CODEN: JESOAN. ISSN: 0013-4651. Publisher: Electrochemical Society.
AB This work investigates the integration of very thin sputtered Ta and reactively sputtered TaN barriers with Cu and a low-dielec.-const. (low-K) layer of poly(arylene ether) (PAE-2). It is found that Cu readily penetrates into PAE-2 and degrades its dielec. strength in metal-insulator semiconductor capacitors of Cu/PAE-2/Si structure at temps. as low as 200.degree.C. Very thin Ta and TaN films of 25 nm thickness sandwiched between Cu and the low-K dielec. served as effective barriers during a 30 min thermal annealing at temps. up to 400 and 450.degree.C, resp. We propose a failure mechanism of outgassing induced gaseous stress of PAE-2 under the Ta film to explain its premature barrier degrdn. The TaN barrier did not suffer from this gaseous stress problem because of its stronger adhesion to PAE-2 than that of Ta to PAE-2, leading to a better long-term reliability.
IT **197923-27-6**, PAE-2
(insulator; elec. reliability issues of integrating thin Ta and TaN barriers with Cu and low-K dielec.)
RN 197923-27-6 HCAPLUS
CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-

ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, PAE-2
(insulator; elec. reliability issues of integrating thin Ta and TaN barriers with Cu and low-K dielec.)

L49 ANSWER 20 OF 26 HCAPLUS COPYRIGHT 2003 ACS
1999:576684 Document No. 131:185424 Functional groups for thermal crosslinking of poly(arylene ether) systems. Burgoyne, William Franklin (Air Products and Chemicals, Inc., USA). Eur. Pat. Appl. EP 939096 A2 19990901, 44 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 1999-102777 19990223. PRIORITY: US 1998-30039 19980225.

AB A novel combination of crosslinking groups, grafted to the backbone of thermally stable polymers, can be thermally induced to crosslink the polymers, giving high Tg thermoset polymers crosslinking at 200-450.degree., and improved in elastic modulus above the Tg, for use as low dielec. materials. A graft technique is used to attach various diarylhydroxymethyl and 9-(9-hydroxyfluorenyl) groups to poly(arylene ether) polymer backbone. Thus, 3 g benzophenone was added to a soln. of lithiated 4,4'-dibromobiphenyl-9,9-bis(4-hydroxyphenyl)fluorene copolymer (20 g) and acetic acid with stirring 17 h at 20.degree. to give a polymer having diphenylhydroxymethyl pendant groups (1.95 groups/repeat), thermally

curable at 425.degree..

IT **187591-30-6P**, 9,9-Bis(4-hydroxyphenyl)fluorene disodium salt-4,4'-dibromobiphenyl copolymer, sru
(modified poly(arylene ether) with functional groups for thermal crosslinking of poly(arylene ether) systems for low dielec. materials)

RN 187591-30-6 HCAPLUS

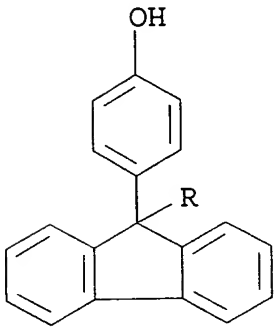
IT **187591-29-3DP**, 4,4'-Dibromobiphenyl-9,9-bis(4-hydroxyphenyl)fluorene disodium salt copolymer, reaction products with ketone
(thermally crosslinked; modified poly(arylene ether) with functional groups for thermal crosslinking of poly(arylene ether) systems for low dielec. materials)

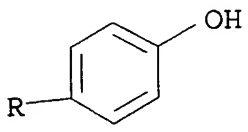
RN 187591-29-3 HCAPLUS

CN Phenol, 4,4'-(9H-fluoren-9-ylidene)bis-, disodium salt, polymer with 4,4'-dibromo-1,1'-biphenyl (9CI) (CA INDEX NAME)

CM 1

CRN 59507-02-7
CMF C25 H18 O2 . 2 Na

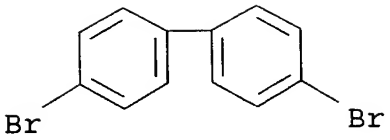




●2 Na

CM 2

CRN 92-86-4
CMF C12 H8 Br2



IT **187591-30-6P**, 9,9-Bis(4-hydroxyphenyl)fluorene disodium salt-4,4'-dibromobiphenyl copolymer, sru
(modified poly(arylene ether) with functional groups for thermal crosslinking of poly(arylene ether) systems for low dielec. materials)

IT **187591-29-3DP**, 4,4'-Dibromobiphenyl-9,9-bis(4-hydroxyphenyl)fluorene disodium salt copolymer, reaction products with ketone
(thermally crosslinked; modified poly(arylene ether) with functional groups for thermal crosslinking of poly(arylene ether) systems for low dielec. materials)

L49 ANSWER 21 OF 26 HCAPLUS COPYRIGHT 2003 ACS

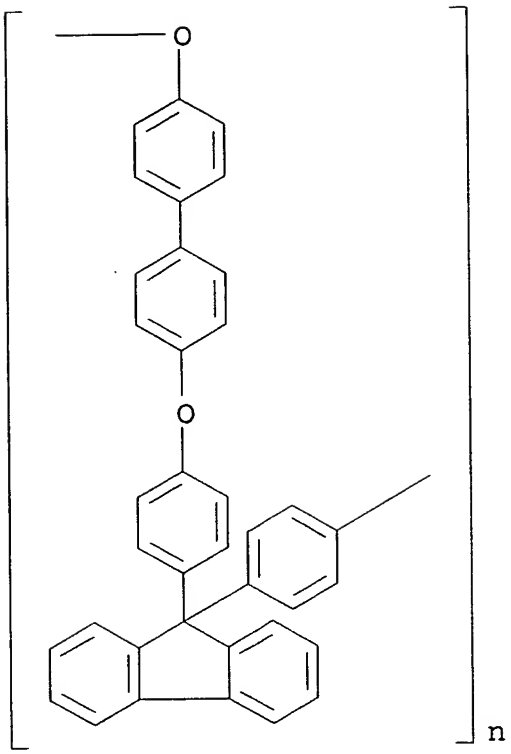
1998:727406 Document No. 130:53035 Compatibility of the low dielectric constant poly(arylether) with the electroless copper deposition solution. Hsu, D. T.; Iskandar, M.; Tong, H. Y.; Shi, F. G.; Lopatin, S.; Shacham-Diamand, Y.; Zhao, Bin; Brongo, M.; Vasudev, P. K. (Department of Chemical Engineering & Biochemical Engineering and Materials Science, University Of California, Irvine, CA, 92697-2575, USA). Proceedings - Electrochemical Society, 98-3(Dielectric Material Integration for Microelectronics), 103-112 (English) 1998. CODEN: PESODO. ISSN: 0161-6374. Publisher: Electrochemical Society.

AB A non-fluorinated poly(aryl ether) is a promising low dielec. const. (low-k) material for ULSI interconnect applications because of its low dielec. const. and thermal stability. FTIR and ellipsometry were employed to investigate possible chem. and phys. property changes in this low-k material before and after its electroless Cu deposition soln. treatments for various soln. temps. and treatment times. Our FTIR results show that there is no chem. reaction between the low-k material and the electroless Cu deposition soln. However, a significant change in thickness as well as refractive index is induced by the electroless soln. It is demonstrated that a thermal cycle treatment can alleviate the electroless Cu soln.-induced effects, as far as the glass transition temp., the coeff. of thermal expansion and refractive index concerned. The low-k material used in this study is fully compatible with the electroless Cu deposition process.

IT **197923-27-6**, PAE-2
(compatibility of low dielec. const. poly(aryl ether) with electroless copper deposition soln.)

RN 197923-27-6 HCAPLUS

CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, PAE-2
(compatibility of low dielec. const. poly(aryl ether) with electroless copper deposition soln.)

L49 ANSWER 22 OF 26 HCAPLUS COPYRIGHT 2003 ACS
1998:700876 Document No. 130:31532 Polymer/metal interfaces in interconnect structures: moisture diffusion and stress corrosion effects. Ma, Qing; Tran, Quan; Pan, Chuanbin; Fujimoto, Harry; Chiang, Chien (Intel Corporation, Santa Clara, CA, 95052, USA). Materials Research Society Symposium Proceedings, 511(Low-Dielectric Constant Materials III), 329-339 (English) 1998. CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials Research Society.

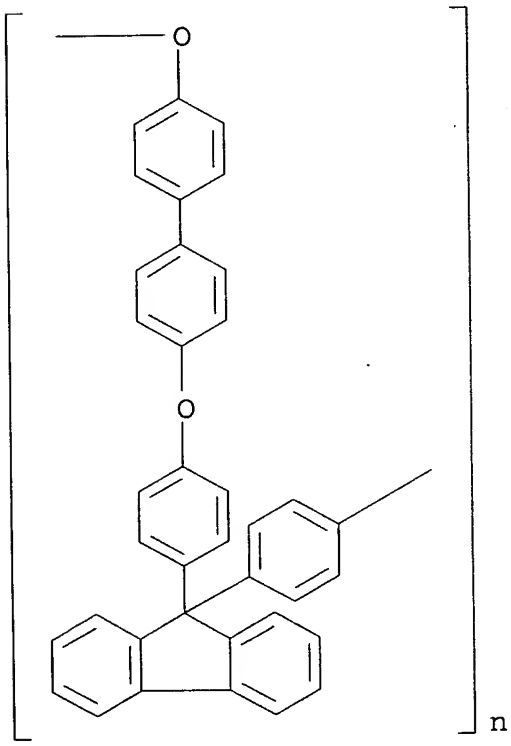
AB Moisture can cause interface debonding of polymer/metal interfaces of integrated circuit interconnects, via bond breaking and cracking under tensile stress. To avoid wet interfaces, Si wafers should be briefly baked or exposed to a plasma in situ before the next film deposition step. However, moisture can also reach interfaces by diffusion along interfaces from unprotected edges during a wet process, such as CMP [capacitively coupled microwave plasma], or during storage. The decrease of interface strength was correlated to the moisture diffusion length of polymer/metal assemblies. A mech. peel technique was used to measure diffusivity of moisture along the interface between Al and a poly(arylene ether) low-K material (PAE2); the moisture diffusivity rate was 4-6 .mu.m2/s.

Stress corrosion was studied using a special 4-point bend technique so that both strain energy release rate and crack velocity can be obtained. The mechanism of stress corrosion at this interface is more complicated compared to that in a bulk material: while the chem. reaction took place at the crack tip, moisture diffusion was also occurring along the interface ahead of the crack tip, preconditioning the interface. There appeared to be a region that kinetics was limited by interfacial moisture diffusion and reaction, from which the reaction time for interface weakening was estd. to be .apprx. 10 s. Even for samples satd. with moisture, the relative humidity of the test environment was still important.

IT **197923-27-6**, PAE2
(moisture diffusion and stress corrosion in polyoxyarylene/aluminum interfaces in interconnects of integrated circuits)

RN 197923-27-6 HCAPLUS

CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, PAE2
(moisture diffusion and stress corrosion in polyoxyarylene/aluminum interfaces in interconnects of integrated circuits)

L49 ANSWER 23 OF 26 HCAPLUS COPYRIGHT 2003 ACS

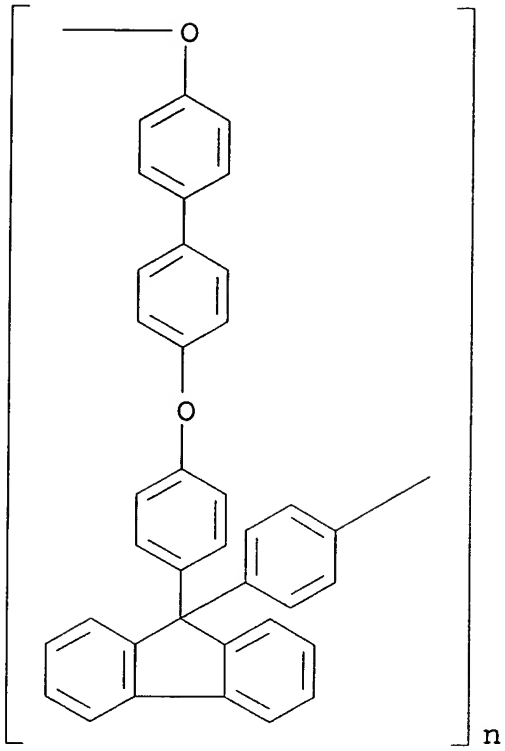
1998:700875 Document No. 130:31745 Electrical reliability of Cu and low-K dielectric integration. Wong, S. Simon; Loke, Alvin L. S.; Wetzel, Jeffrey T.; Townsend, Paul H.; Vrtis, Raymond N.; Zussman, Melvin P. (Center for Integrated Systems, Stanford University, Stanford, CA, 94305, USA). Materials Research Society Symposium Proceedings, 511(Low-Dielectric Constant Materials III), 317-327 (English) 1998. CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials Research Society.

AB Elec. testing techniques were used to evaluate Cu+ drift behavior of low-K polymer dielecs. for use as encapsulation materials for integrated circuits. Bias-temp. stress and capacitance-voltage measurements were used based on high sensitivity, well-suited for examg. charge instabilities in dielecs. Charge instabilities other than Cu+ drift also exist. When low-K polymers come into direct contact with either a metal or Si, interface-related instabilities attributed to electron/hole injection are obsd. To overcome these issues, a planar Cu/oxide/polymer/oxide/Si capacitor test structure was developed for Cu+ drift evaluation. The Cu+ ions were obsd. to drift readily into PAE2 poly(arylene ether) and FPI-136M fluorinated polyimide, but much more slowly into Cyclotene 5021. A thin nitride cap layer can prevent the penetration.

IT **197923-27-6**, PAE2
(copper ion drifting in dielec. low-K polyoxyarylenes and fluoropolyimides and siloxanes for encapsulation of interconnects for integrated circuits)

RN 197923-27-6 HCAPLUS

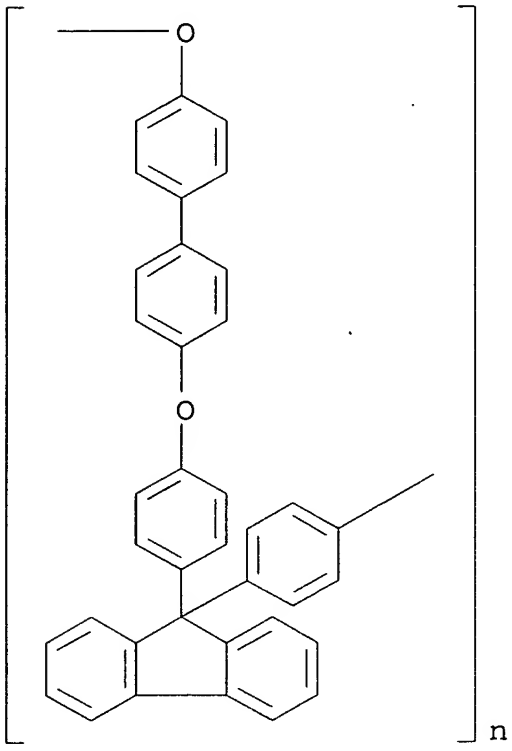
CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, PAE2
(copper ion drifting in dielec. low-K polyoxyarylenes and fluoropolyimides and siloxanes for encapsulation of interconnects for integrated circuits)

L49 ANSWER 24 OF 26 HCAPLUS COPYRIGHT 2003 ACS
1997:621197 Document No. 127:339789 Poly(arylene ethers) as low dielectric constant materials for ULSI [ultra large-scale integration] interconnect applications. Vrtis, Raymond N.; Heap, Kelly A.; Burgoyne, William F.; Robeson, Lloyd M. (Schumacher, Carlsbad, CA, 92009, USA). Materials Research Society Symposium Proceedings, 443(Low-Dielectric Constant Materials II), 171-176 (English) 1997. CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials Research Society.
AB Poly(arylene ethers) are low-dielec.-const. org. spin on materials. PAE-2, which is a non-fluorinated poly(arylene ether), exhibited a dielec. const. <3.0, thermal stability >425.degree., as well as excellent adhesion to Si, SiO2, and Al. These were the major attributes which makes it a very attractive candidate for integration as an interlevel or inter-metal dielec. material (ILD). In addn., PAE-2 can successfully fill small feature sizes with good planarity. Material properties including dielec. const., thermal stability, moisture absorption, and mech. anal. were discussed.
IT **197923-27-6**, PAE 2
(poly(arylene ethers) as low-dielec.-const. materials for ULSI

interconnect applications)
RN 197923-27-6 HCAPLUS
CN Poly(oxy[1,1'-biphenyl]-4,4'-diyloxy-1,4-phenylene-9H-fluoren-9-ylidene-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **197923-27-6**, PAE 2
(poly(arylene ethers) as low-dielec.-const. materials for ULSI interconnect applications)

L49 ANSWER 25 OF 26 HCAPLUS COPYRIGHT 2003 ACS
1997:250895 Document No. 126:239422 Nonhalogenated poly(arylene ether) dielectrics. Burgoyne, William Franklin, Jr.; Vrtis, Raymond Nicholas; Robeson, Lloyd Mahlon (Air Products and Chemicals, Inc., USA). Eur. Pat. Appl. EP 758664 A1 19970219, 21 pp. DESIGNATED STATES: R: DE, FR, GB, IE, IT, NL. (English). CODEN: EPXXDW. APPLICATION: EP 1996-305114 19960711. PRIORITY: US 1995-502511 19950714.
AB Poly(arylene ethers) comprising repeat units of (OZ1OZ2)m(OZ3OZ4)n (Z1-Z4 = non-functionalized divalent arylene radical; m = 0-1.0; n = 1.0 - m) are dielec. materials for use in microelectronic devices. Preferably the divalent radicals are selected from certain phenylene, biphenylene, triphenylene, naphthalene, anthracene, phenanthrene, 9,9-diphenylfluorene and dibenzofuran di-radicals. Thus, polymn. of 9,9-Bis(hydroxyphenyl)fluorene with 4,4'-dibromobiphenyl gave a polymer having Mw 65,300, Mw/Mn 3.16,

and good film-forming properties.

IT **187591-30-6P 188432-91-9P**
(crosslinked; nonhalogenated poly(arylene ether) dielecs.)

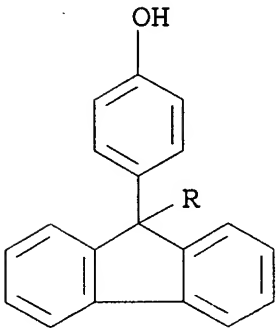
RN 187591-30-6 HCAPLUS

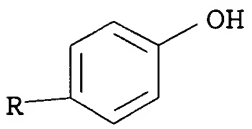
RN 188432-91-9 HCAPLUS

CN Phenol, 4,4'-(9H-fluoren-9-ylidene)bis-, polymer with 4,4'-dibromo-1,1'-biphenyl (9CI) (CA INDEX NAME)

CM 1

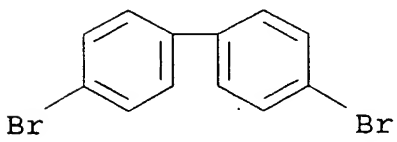
CRN 3236-71-3
CMF C25 H18 O2





CM 2

CRN 92-86-4
CMF C12 H8 Br2



IT **188432-97-5P**
(nonhalogenated poly(arylene ether) dielecs.)

RN 188432-97-5 HCAPLUS

CN Phenol, 4,4'-(9H-fluoren-9-ylidene)bis-, polymer with 4,4'-dibromo-1,1'-biphenyl and 4,4''-dibromo-1,1':4',1''-terphenyl

(9CI) (CA INDEX NAME)

CM 1

CRN 17788-94-2
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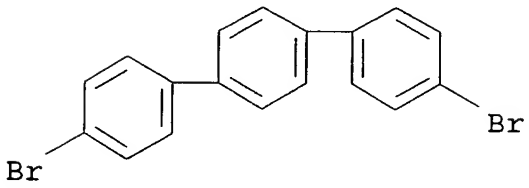
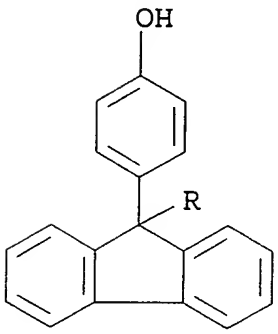
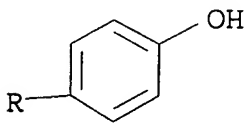


CM 2

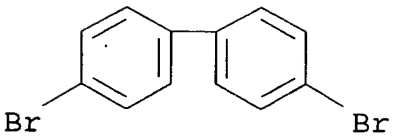
CRN 3236-71-3
CMF C25 H18 O2





CM 3

CRN 92-86-4
CMF C12 H8 Br2

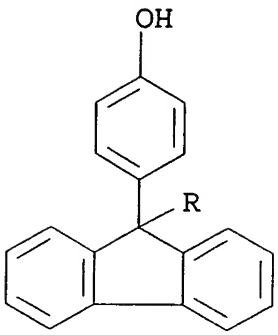


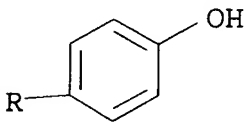
IT **187591-30-6P 188432-91-9P**
(crosslinked; nonhalogenated poly(arylene ether) dielecs.)
IT **188432-97-5P**
(nonhalogenated poly(arylene ether) dielecs.)

L49 ANSWER 26 OF 26 HCAPLUS COPYRIGHT 2003 ACS
1997:195643 Document No. 126:186848 Nonhalogenated poly(arylene ethers) for dielectric insulating layers. Burgoyne, William Franklin, Jr.; Vrtis, Raymond Nicholas; Robeson, Lloyd Mahlon (Air Products and Chemicals, Inc., USA). Eur. Pat. Appl. EP 755957 A1 19970129, 22 pp. DESIGNATED STATES: R: DE, FR, GB, IE, IT, NL. (English). CODEN: EPXXDW. APPLICATION: EP 1996-305118 19960711. PRIORITY: US 1995-502508 19950713.
AB Novel poly(arylene ether) polymers have repeating units (OZOAr1)m(OAr2OAr3)n wherein Z = 9,9-fluorenedi-p-phenylene, m = 0 to 1, n = 1.0-m, and Ar1, Ar2, and Ar3 are individually non-functionalized divalent arylene radicals. Preferably the divalent arylene radicals are selected from phenylene, biphenylene, triphenylene, naphthalene, anthracene, phenanthrene, 9,9-diphenylfluorene and dibenzofuran diradicals. The polymers are useful as low dielec. insulating layers in microelectronics, esp. in multilayer electronic circuit articles and multichip modules. Thus, 9,9-bis(4-hydroxyphenyl)fluorene was polymd. with 4,4'-dibromobiphenyl to give an arom. polyether exhibiting higher Tg and enhanced high temp. thermal stability compared to arom. polyethers contg. hexafluorobisphenol A units. The prepd. polymers also exhibit a low moisture absorption which was an improvement over polyimide compns. used as dielec. materials. The prepd. polyethers were coated on a Si chip to give a coating with dielec. const. 2.28 at 1 MHz, and after thermal curing 2.41 at 1 MHz.
IT **187591-29-3P**, 9,9-Bis(4-hydroxyphenyl)fluorene disodium salt-4,4'-dibromobiphenyl copolymer **187591-30-6P**, 9,9-Bis(4-hydroxyphenyl)fluorene disodium salt-4,4'-dibromobiphenyl copolymer, sru **187591-36-2P**
(manuf. of nonhalogenated polyoxyarylenes with good properties for dielec. insulating layers)
RN 187591-29-3 HCAPLUS
CN Phenol, 4,4'-(9H-fluoren-9-ylidene)bis-, disodium salt, polymer with 4,4'-dibromo-1,1'-biphenyl (9CI) (CA INDEX NAME)

CM 1

CRN 59507-02-7
CMF C25 H18 O2 . 2 Na

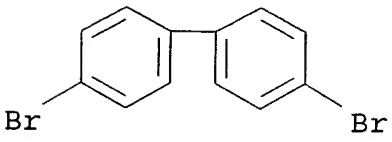




2 Na

CM 2

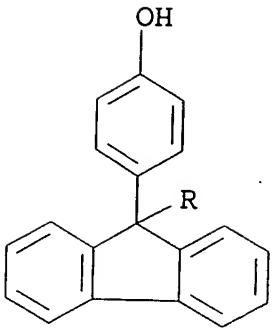
CRN 92-86-4
CMF C12 H8 Br2

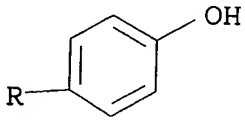


RN 187591-30-6 HCAPLUS
RN 187591-36-2 HCAPLUS
CN Phenol, 4,4'-(9H-fluoren-9-ylidene)bis-, disodium salt, polymer with 4,4'-dibromo-1,1'-biphenyl and 4,4''-dibromo-1,1':4',1''-terphenyl (9CI) (CA INDEX NAME)

CM 1

CRN 59507-02-7
CMF C25 H18 O2 . 2 Na

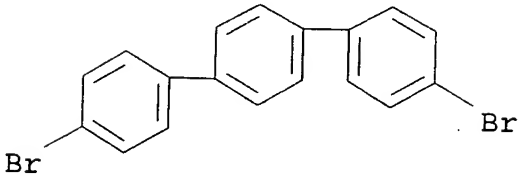




●2 Na

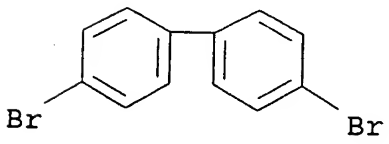
CM 2

CRN 17788-94-2
CMF C18 H12 Br2



CM 3

CRN 92-86-4
CMF C12 H8 Br2



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(manuf. of nonhalogenated polyoxyarylenes with good properties for dielec. insulating layers)